SHARP SERVICE MANUAL

No. SX789MDMS702H

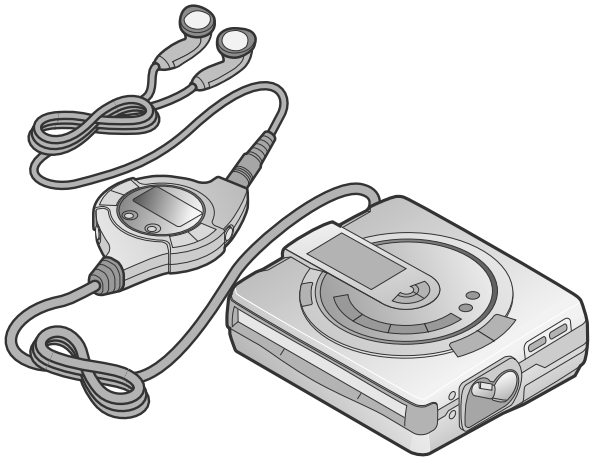

Illustration: MD-MS701H

MD-MS701H
MD-MS702H(BL)
MD-MS702H(GY)

• In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified should be used.

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SHARP CORPORATION

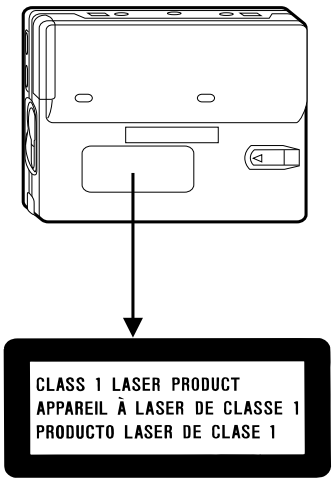
This document has been published to be used for after sales service only.
The contents are subject to change without notice.

SAFETY PRECAUTION FOR SERVICE MANUAL

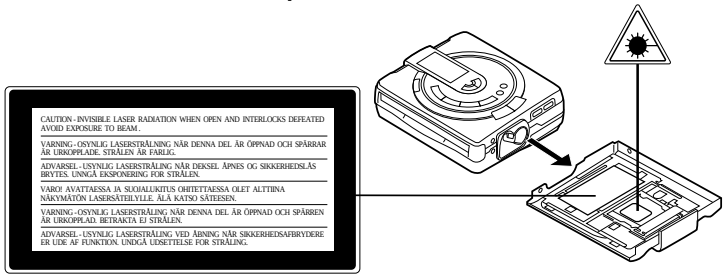
Precaution to be taken when replacing and servicing the Laser Pickup.

The AEL (Accessible Emission Level) of Laser Power Output for this model is specified to be lower than Class I Requirements. However, the following precautions must be observed during servicing to protect your eyes against exposure to the laser beam.

(1) When the cabinet has been removed, the power is turned on without a compact disc, and the Pickup is on a position outer than the lead-in position, the Laser will light for several seconds to detect a disc. Do not look into the Pickup Lens.
(2) The Laser Power Output of the Pickup inside the unit and replacement service parts have already been adjusted prior to shipping.
(3) No adjustment to the Laser Power should be attempted when replacing or servicing the Pickup.
(4) Under no circumstances look directly into the Pickup Lens at any time.
(5) CAUTION - Use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.



LASER KLASSE 1
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT
LASER TŘÍDY 1
LASER TRIEDY 1


CAUTION - INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED AVOID EXPOSURE TO BEAM.
VARNING - OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRRAR ÄR URKOPPLADE. STRÅLEN ÄR FARLIG.
ADVARSEL - USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VARO! AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTÖN LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEN.
VARNING - OSYNLIG LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVARSEL - USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSETTELSE FOR STRÅLING.

Laser Diode Properties
- Material: GaAIAs
- Wavelength: 785 nm
- Pulse time:
  Read mode: 0.8 mW Continuous
  Write mode: max 10 mW 0.5
  min cycle 1.5S
  Repetition

VAROITUS! LAITTEEN KÄYTTÄMINEN MUULLA KUIN TÄSSÄ KÄYTTÖOHJEESSA MAINITULLA TAVALLA SAATTAA ALTISTAA KÄYTTÄJÄN TURVALLISUUSLUOKAN 1 YLITTÄVÄLLE NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE.

VARNING - OM APPARATEN ANVÄNDS PÅ ANNAT SÄTT ÄN I DENNA BRUKSANVISNING SPECIFICERAS, KAN ANVÄNDAREN UTSÄTTAS FÖR OSYNLIG LASERSTRÅLNING, SOM ÖVERSKRIDER GRÄNSEN FÖR LASERKLASS 1.

VARO ! Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.
VARNING! Osynlig laserstralning när denna del är öppnad och spärren är urkopplad. Betrakta ej strälen.

Precaution to be taken when replacing and servicing the laser pickup.
The following precautions must be observed during servicing to protect your eyesagainst exposure to the laser.

Warning of possible eye damage when repairing:
If the AC adaptor or batteries are connected when the top housing (disc cover) of the unit is removed, and the PLAY key is pressed, the laser will light up during docus access (2-3 seconds). (Fig. 2-1) During the operation, the laser will lesk from the opening btween the magnetic head and the mechanical chassis (Fig. 2-2). In order to protect your eyes, you most not look at the laser durnd repaor. Before repaoring be sure to disconnect the AC adaptor and remove the batteries.

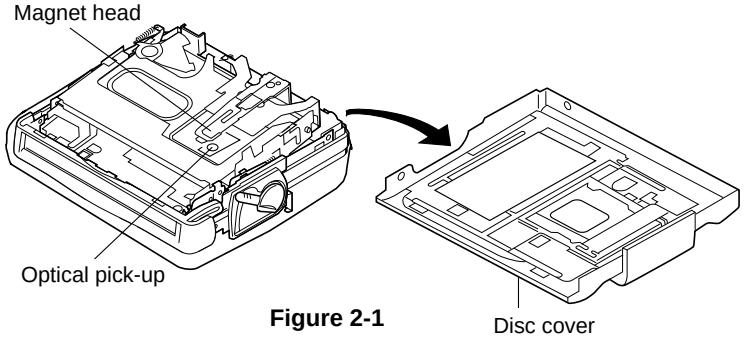


Figure 2-1

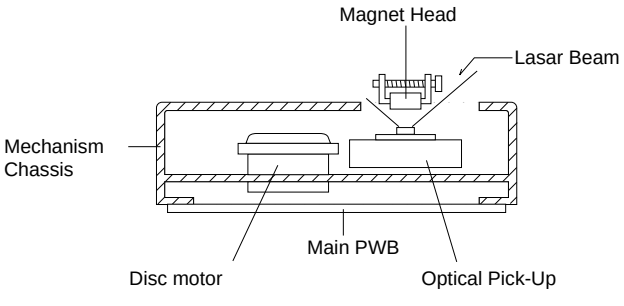


Figure 2-2

FOR A COMPLETE DESCRIPTION OF THE OPERATION OF THIS UNIT, PLEASE REFER TO THE OPERATION MANUAL.

SPECIFICATIONS

● General

Power source: DC 3.6 V (rechargeable lithium-ion battery x 1)
DC 5 V (AC adaptor)
AC 110 - 240V, 50/60 Hz
DC 3V: Separately available battery case, AD-M70BC (commercially available, "AA" size, alkaline battery x 2)
DC 4.5V: Separately available car adaptor, AD-CA20X (for cars with a 12-24V DC negative earth electrical system)

Power consumption: 0.15 A (AC adaptor)
4 W

Output power: RMS; 20 mW (10 mW + 10mW) (0.2% T.H.D.)

Charging time: Approx. 2.5 hours (When using the AC adaptor included with the unit)

Battery life:

When using the rechargeable battery (fully charged) included with the unit	When using two, commerically available, high capacity, "AA" size, alkaline batteries (in the separately available battry case)	When using two, commercially available, high capacity, "AA" size batteries with the rechargeable battery (fully charged)
Continuous recording: Approx. 3.5 hours	Continuous recording: Approx. 4 hours	Continuous recording: Approx. 7.5 hours
Continuous play: Approx. 5 hours	Continuous play: Approx. 8 hours	Continuous play: Approx. 13 hours

- The continuous recording time is for analogue input when the volume level is set to "VOL 0".
- The continuous play time shows the value when the volume level is set to "VOL 15".
- The above values are the standard values when the unit is charged and used at an ambient temperature of 20°C.
- The operating time when using alkaline batteries may be different, depending on the type and manufacturer of the batteries, and on the operating temperature.

Input sensitivity:

Recording level	Reference input level	Input impedance
MIC H	0.25 mV	10 k ohms
MIC L	2.5 mV	10 k ohms
LINE	100 mV	20 k ohms

Output level:

	Specified output	Maximum output level	Load impedance
Headphones	—	10 mW + 10 mW	32 ohms
LINE	300mV (-12dB)	—	50 kohms

Dimensions: Width: 87.0 mm (3-7/16")
Height: 29.4 mm (1-3/16")
Depth: 81.5 mm (3-7/32")

Weight: MD-MS701H: 216 g (0.48 lbs.) with rechargeable battery
MD-MS702H: 219 g (0.49 lbs.) with rechargeable battery

Input socket: Line/Mic/optical digital, microphone (powered by the main unit)

Output socket: Headphones (impedance: 32 ohms)/remote control unit

● MiniDisc Recorder

Type: Portable MiniDisc recorder

Signal readout: Non-contact, 3-beam semi-coductor laser pick-up

Audio channels: Stereo 2 channels/monaural (long-play mode) 1 channel

Frequency response: 20 - 20,000 Hz (± 3 dB)

Rotation speed: Approx 400 - 900 rpm

Error correction: ACIRC (Advanced Cross Interleave Reed-Solomon Code)

Coding: ATRAC (Adaptive TRansform Acoustic Coding), 24-bit computed type

Recording method: Magnetic modulation overwrite method

Sampling frequency: 44.1 kHz (32 kHz and 48 kHz signals are converted to 44/1 kHz, and then recorded.)

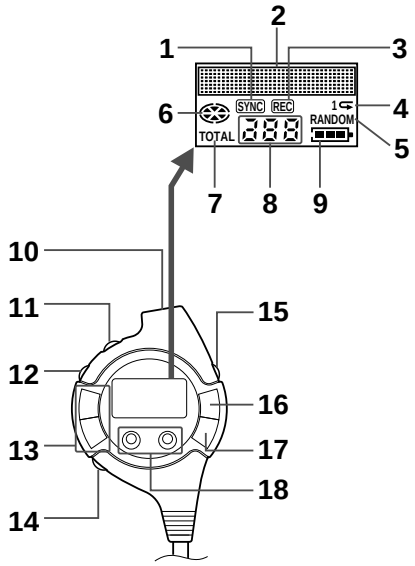
Wow and flutter: Unmeasurable (less than ±0.001% W.peek)

Specifications for this model are subject to change without prior notice

NAME OF PARTS

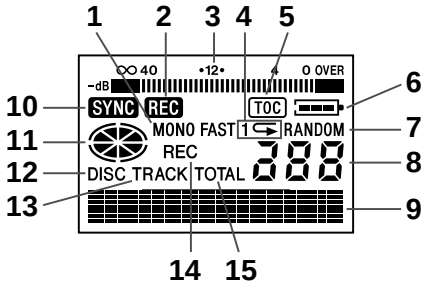
■ Remote Control Unit

1. Synchro Recording Indicator
2. Character/Time Information Indicator
3. Record Indicator
4. Repeat Indicator:
5. Random Indicator
6. Disc Mode Indicator
7. Total Track Number Display
8. Track Number Indicator
9. Battery Indicator:
10. Headpones Socket
11. Hold Switch
12. Play Mode Button
13. Volume Buttons: +, -
14. Bass Button
15. Display Button
16. Play/Pause Button: ►II
17. Stop/Power Off Button: ■
18. Fast Reverse/Fast Forward Buttons: I◄◄ / ►►I

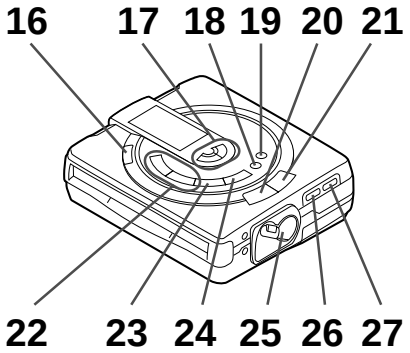


■ Main Unit

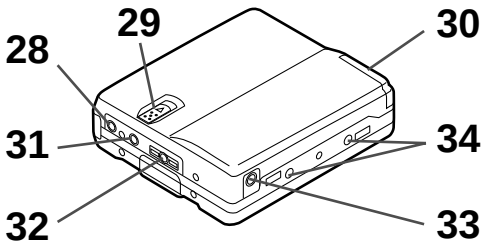
1. Monaural Long-Play Mode Indicator
2. Record Indicator
3. Level Meter
4. Repeat Indicator:
5. TOC Indicator
6. Battery Indicator:
7. Random Indicator
8. Track Number Indicator
9. Character/Time Information Indicator
10. Synchro Recording Indicator
11. Disc Mode Indicator
12. Disc Name Indicator
13. Track Name Indicator
14. Remaining Recording Time Indicator
15. Total Track Number Display



16. Record/Track Mark Button
17. Volume/Name Select Buttons: +, -
18. Display/Lowercase Characters Button
19. Character Button
20. Stop/Power Off/Charge Button: ■ /:OFF
21. Play/Pause Button: ►II
22. Fast Reverse/Fast Forward/Recording Level Control/Cursor Buttons: I◄◄ / ►►I
23. Enter/Fast Play/Synchro Button
24. Editer/Auto Mark/Time Mark Button
25. Eject Lever
26. Bass/Delete Button
27. Mode/Insert Button



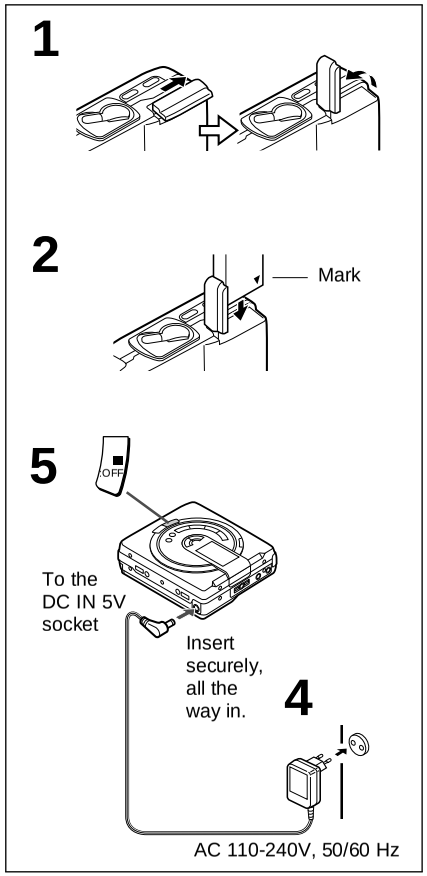
28. Microphone Input Socket
29. Hold Switch
30. Rechargeable Lithium-Ion Battery Compartment
31. Optical/Line Input Soket
32. Headphones Soket
33. 5V DC Input Sokets
34. Battert Case Connection Terminals



OPERATION MANUAL

POWER SOURCE

This unit can be used with 4 different power sources: a rechargeable battery, an AC adaptor, a separately available battery case (AD-M70BC), and a separately available car adaptor (AD-CA20X).



■ Rechargeable battery power

When the rechargeable battery is used for the first time or when you want to use it after a long period of disuse, be sure to charge it fully.

1 Open the rechargeable battery compartment cover.

2 Insert the rechargeable battery.
- Insert the side with the arrow first.

3 Close the rechargeable battery compartment cover.

4 Plug the AC adaptor into the AC socket, and then insert the plug on the AC adaptor lead into the DC IN 5V socket.

5 Press the ■/:OFF button twice to begin charging.
- "▭" will appear, and the battery will begin charging.
- Battery charging will be complete in 2.5 hours. When the charging is complete, "▭" will go out.

Notes:
- After charging has been completed, the AC adaptor may be left connected. (For example, when charging at night)
- The battery will not be charged whenever the power to the main unit is turned on.
- If the AC adaptor is removed from the main unit or from the AC socket whilst charging, "▭" will not disappear for about 1 minute. This is normal.
- Do not force open the rechargeable battery cover too wide.
- Do not fit the separately available battery case when charging the internal battery.

MINIDISC SYSTEM LIMITATIONS

MiniDiscs are recorded using a different system than is used for cassette tapes or DAT recordings. Therefore, the following conditions may be encountered, depending on how the disc has been recorded or edited. These are due to system limitations, and should be considered normal.

Even if the maximum recording time of a MiniDisc has not been reached, "DISC FULL" or "TOC FULL" may be displayed.	When the number of tracks used reaches the limit, regardless of the remaining recording time, further recording will be impossible. (Maximum number of tracks: 254) If a MiniDisc has been recorded or edited repeatedly or if a MiniDisc has scratches on it, it may not be possible to record the maximum number of tracks on it.
Even if the number of tracks and the recording time have not reached the limit, "DISC FULL" may be displayed.	If there are scratches on a disc, the unit will automatically avoid recording in those areas. The recording time will be reduced.
Even if several short tracks are erased, the remaining recording time may not show an increase.	When the remaining recording time of a disc is displayed, short tracks less than 8 seconds long may not be included in the total.
Two tracks may not be combined in editing.	For MiniDiscs on which repeated recording and editing operations were performed, the COMBINE function may not work.
The total of the recorded time and time remaining on a disc may not add up to the maximum possible recording time.	A cluster (about 2 seconds) is normally the minimum unit of recording. So, even if a track is less than 2 seconds long, it will use about 2 seconds of space on the disc. Therefore, the time actually available for recording may be less than the remaining time displayed. If there are scratches on discs, those sections will be automatically avoided (no recording will be placed in those sections). Therefore, the recording time will be reduced.
When recorded tracks are played back using the cue and review operations, some sounds may be skipped.	For MiniDiscs on which repeated recording and editing were performed, some sounds may be skipped whilst cueing and reviewing.
A track number can be created in the middle of a track.	If there are scratches or dust on a MiniDisc, the track numbers following that track will be increased by one.

TROUBLESHOOTING

■ Moisture condensation

In the following cases, condensation may form inside the unit.

- Shortly after turning on a heater.
- When the unit is placed in a room where there is excessive steam or moisture.
- When the unit is moved from a cool place to a warm place.

When the unit has condensation inside the disc signals cannot be read, and the unit may not function properly.

- If this happens, remove the disc. The condensation should evaporate in approximately 1 hour. The unit will then function properly.

Many potential "problems" can be resolved by the owner without calling a service technician. If something seems to be wrong with this product, check the following before calling your authorised SHARP dealer or service centre.

PROBLEM	CAUSE
The unit does not turn on.	● Is the AC adaptor disconnected? ● Is the battery exhausted? ● Is the unit in the safety mode? ● Has condensation formed inside the unit? ● Is the unit being influenced by mechanical shock or by static electricity?
No sound is heard from the headphones.	● Is the volume set too low? ● Is the remote control unit or the headphones plugged in? ● Are you trying to play a MiniDisc with data on it instead of a MiniDisc containing music?
When the operation buttons are pressed, the unit does not respond.	● Is the unit in the safety mode? ● Is the battery exhausted? ● Is the remote control unit plug or the headphone plug inserted firmly?
Some sounds are skipped.	● Is the battery exhausted? ● Is the unit being subjected to excessive vibration?
The MiniDisc cannot be ejected.	● Has the track number or character information been written on the disc yet? ● Is the unit in the recording or editing mode?
Recording and editing are impossible.	● Is the MiniDisc protected against accidental erasure? ● Is the unit connected properly to the other equipment? ● Is the AC adaptor unplugged or did a power failure occur whilst recording or editing? ● Is the unit in the safety mode?

■ If trouble occurs

When this product is subjected to strong external interference (mechanical shock, excessive static electricity, abnormal supply voltage due to lightning, etc.) or if it is operated incorrectly, it may malfunction. If such a problem occurs, do the following:

1. Unplug the AC adaptor from the AC socket.
2. Remove the battery.
3. Leave the unit completely unpowered for approximately 30 seconds.
4. Plug the AC adaptor back into the AC socket and retry the operation.

If strange sounds, smell or smoke come out of the unit or an object is dropped into the unit, remove the AC adaptor from the AC socket immediately and contact an authorised Sharp service centre.

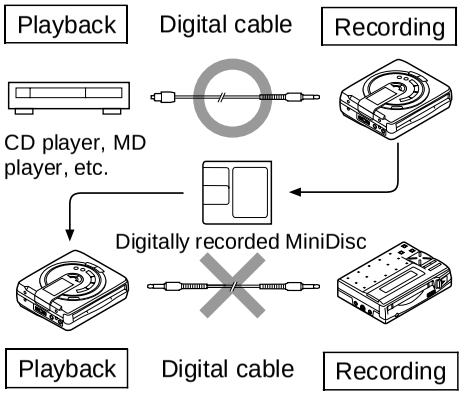
RECORDING USING A SEPARATELY AVAILABLE DIGITAL CABLE

There are cases where digital recording may be impossible.

In the following cases digital recording is impossible, even if you are using digital cables.

When you attempt to make a new digital recording from a track that was digitally recorded on a MiniDisc

- MiniDiscs are designed so that only first generation digital copies can made, further digital copies are prevented by the SCMS (Serial Copy Management System).

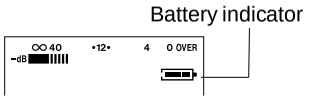


Analogue recording is possible.

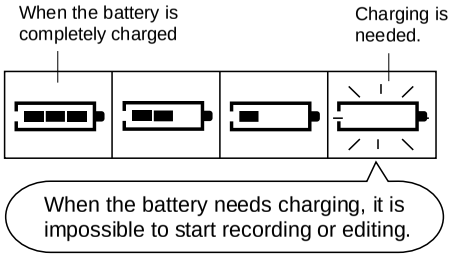
CONVENIENT OPERATION OF THE UNIT

■ Checking the remaining amount of battery charge

The remaining amount of battery charge is shown by the battery indicator (▬) during operation.



< How to read the battery indicator >


When the battery is completely charged
Charging is needed.
When the battery needs charging, it is impossible to start recording or editing.

- When the battery is completely discharged, the whole battery indicator will flash. Recharge the battery or replace the alkaline batteries with new ones.
- When the battery has run completely out, "BATT EMPTY" (main unit) and "Lo BATT" (remote control unit) will appear. Then, the power will be disconnected automatically.

Notes:

- When the AC adaptor included with this unit or a separately available car adaptor is used, the battery indicator will not be shown.
- The number of bars shown in the battery indicator may increase or decrease, depending on the operation being performed. This is normal.
- When the rechargeable battery and the alkaline batteries are used at the same time, the rechargeable battery is used first, and then the alkaline batteries.
  Since the battery indicator shows the remaining amount of the particular battery being used, the number of bars will increase when the unit switches to the alkaline batteries.

ERROR MESSAGES

Error messages	Meaning	Remedy
BATT EMPTY	● The battery run down.	● Charge the rechargeable battery or replace the alkaline batteries (or use the AC adaptor for power).
BLANK DISC	● Nothing is recorded.	● Replace the disc with a recorded disc.
Can't COPY	● No copy can be made because of the SCMS copyright system.	● Record using the analogue cable.
Can't EDIT	● A track cannot be edited.	● Change the stop position of the track and then try editing it.
Can't REC	● Recording cannot be performed correctly due to vibration or shock in the unit.	● Re-record or replace it with another recordable disc.
Can't WRITE	● Editing is impossible.	● Check the number of tracks.
DEFECT	● The disc is scratched.	● If the sound you hear is not right, try recording again. ● Replace the disc with another recordable disc.
Din UNLOCK	● Poor connection of the digital cable.	● Connect the digital cable securely.
DISC ERROR	● The disc is damaged.	● Reload the disc or replace it.
DISC FULL	● The disc is out of recording space.	● Replace it with another recordable disc.
HOLD	● The unit is in the safety mode.	● Return the HOLD switch to its original position.
LOCKED LOCK ERROR	● The EJECT lever was moved during recording or editing.	● Turn off the power and remove the MiniDisc.
NO DISC	● A disc has not been loaded.	● Load a disc.
PB DISC PROTECTED	● The disc is write protected. ● You tried to record on a playback-only disc.	● Move the write protection knob back to its original position. ● Replace it with a recordable disc.
POWER ?	● Improper power is being supplied.	● Use one of the specified power sources.
SORRY	● Since a track number is currently being located or written to, the unit cannot accept your command.	● Wait for a while and try the operation again.
SYSTEM ERR	● You have come to the conclusion that the unit is out of order.	● To have it repaired, go to the distributor where you purchased the unit.
TEMP OVER	● The temperature is too high.	● Turn off the power, and wait for a while.
TOC ERROR	● A large portion of the disc has been damaged.	● Replace it with another recorded disc.
TOC FULL	● There is no space left for recording character information (track names, disc names, etc.).	● Replace it with another recordable disc.
Tr. Protect	● The track has been protected from being erased.	● Edit the track with the device on which it was recorded.
U TOC ERROR	● A large portion of the disc has been damaged. ● There is an error in the recorded signal.	● Replace it with another recorded disc. ● Erase all of the signal errors, and then try recording again.
? DISC	● A disc which contains data other than music was played. ● There is an error in the signal from the disc.	● A disc which contains non-music data cannot be played. ● Replace it with another recorded disc.

DISASSEMBLY

Caution on Disassembly

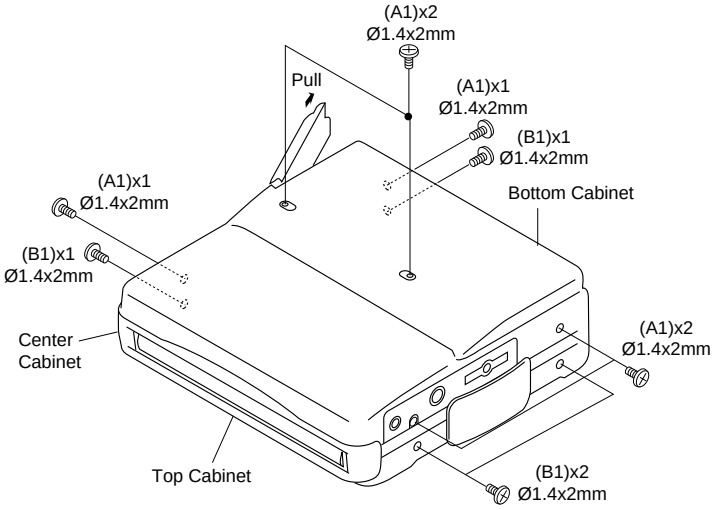
Follow the below-mentioned notes when disassembling the unit and reassembling it, to keep it safe and ensure excellent performance:

1. Take the battery and minidisc out of the unit.
2. When disassembling the machine, be sure to withdraw the power plug from the socket in advance.
3. When disassemble the parts, remove the nylon band or wire holder as necessary.
   To assemble after repair, be sure to arrange the wires as they were.
   If a screw of different length is fitted to the MD mechanism (the screw of the part to be fitted to the MD mechanism chassis), it may contact the optical pickup, resulting in malfunction.
4. When repairing, pay due attention to electrostatic charges of IC.

STEP	REMOVAL	PROCEDURE	FIGURE
1	Bottom Cabinet	1. Open the battery Lid. 2. Screw ..... (A1) x6	8-1
2	Top Cabinet	1. Screw ..... (B1) x4 2. Flat Cable ..... (B2) x2	8-1
3	Main PWB	1. Screw ..... (C1) x2 2. Flat Cable ..... (C2) x3	8-2
4	Mechanism Unit	1. Lift the left side, and remove in the arrow direction.	8-3

Caution:

1. Handle carefully the main PWB and flexible PWB.
   After removing the flexible PWB (*1) for optical pickup from the connector, wrap the front end of flexible PWB in conductive aluminum foil so as to protect the optical pickup from electrostatic damage.
2. When removing the mechanism from the cabinet or when installing it, it is advisable to
   rotate the unit lock plate to lower the holder section.



Figu re 8-1

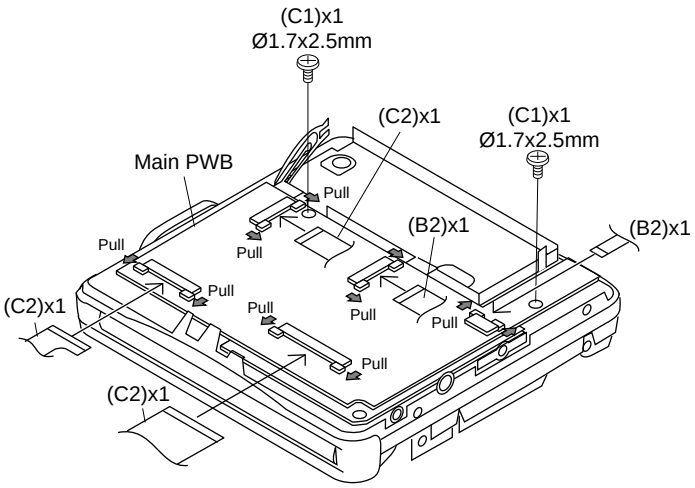


Figure 8-2

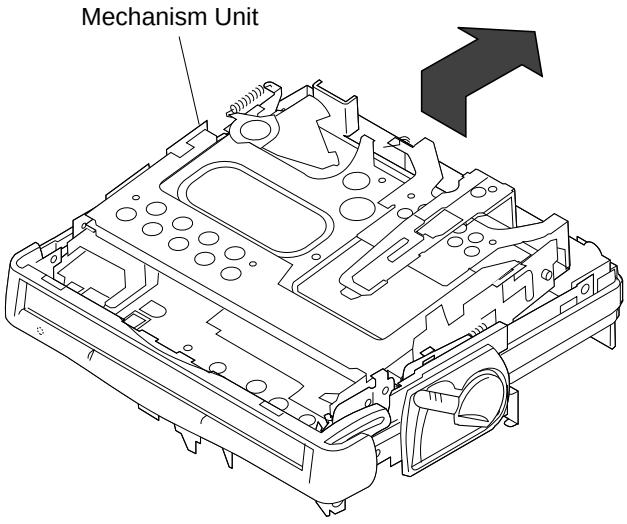


Figure 8-3

REMOVING AND REINSTALLING THE MAIN PARTS

Remove the mechanism according to the disassembling methods 1 to 3. (See Page 8.)

How to remove the spindle motor (See Fig. 9-1.)

1. Remove the solder joint (A1) x 1 of flex PWB.
2. Remove the stop (A2) x 3 pcs. and remove the spindle motor.

How to remove the lift motor (See Fig. 9-2.)

1. Remove the solder joint (B1) x 2 of slide motor lead wire.
2. Remove the stop washer (B2) x 1 pc., and remove the drive gear (B3) x 1 PC.
3. Remove the screw (B4) x 1, and remove the lift motor.

Note:
Take care so that the motor gear is not damaged.
(If the gear is damaged, noise is raised in search mode.)

How to remove the sled motor (See Fig. 9-3.)

1. Remove the solder joint (C1) x 2 of slide motor lead wire.
2. Remove the screw (C2) x 2, and remove the sled motor.

Note:
Take care so that the motor gear is not damaged.
(If the gear is damaged, noise is raised in search mode.)

How to remove the magnetic head (See Fig. 9-4.)

1. Remove the screw (D1) x 2 pc.
2. Remove the screw (D2) x1 which connects the magnetic head to the head relay flex PWB, and remove the soldering joint (D3) x2 pcs.

Note:
Mount carefully so as not to damage the magnetic head.

How to reinstall the optical pickup unit (See Fig. 9-5.)

1. Remove the screws (E1) x 1 pcs.
2. Remove the soldering joint (C2) x2 places of flex PWB, and remove the sled motor.

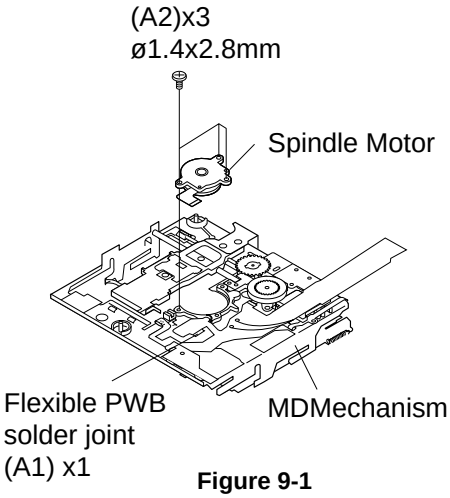


Figure 9-1

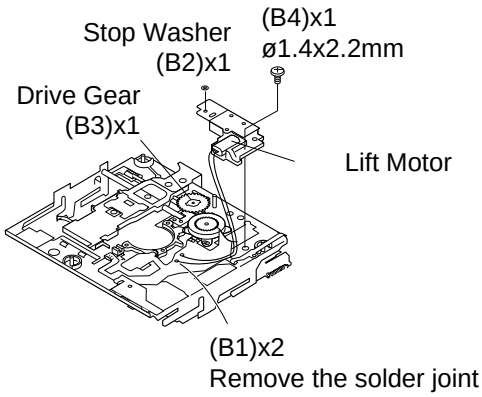


Figure 9-2

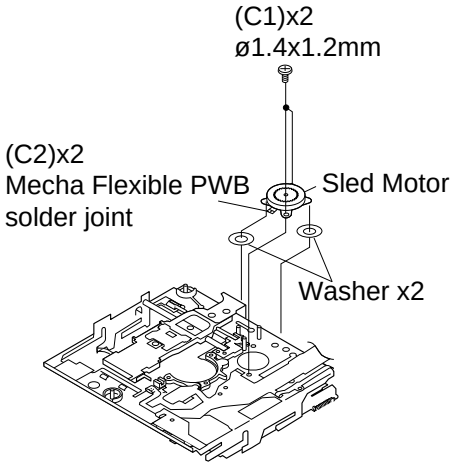


Figure 9-3

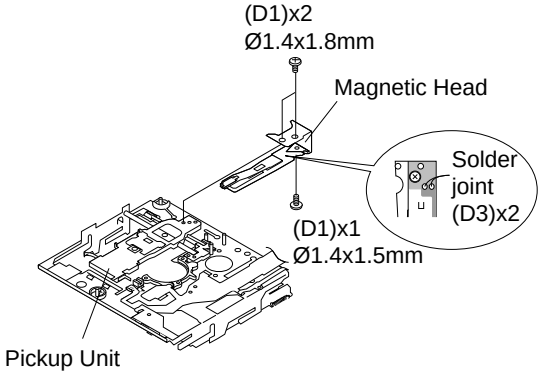


Figure 9-4

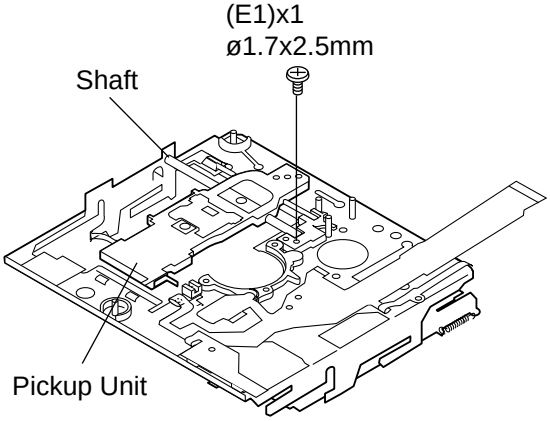


Figure 9-5

ADJUSTMENT

● Test disc

MD adjustment needs two types of disc, namely recording disc (low reflection disc) and playback-only disc (high reflection disc).

	Type	Test disc	Parts No.
1	High reflection disc	MMD-110 (TEAC Test MD)	88GMMD-110
2	Lowreflection disc	MMD-212 (TEAC Test MD)	88GMMD-212
3	Low reflection disc	Recording minidisc	UDSKM0001AFZZ

Note: Use the low reflection disc on which music has been recorded.

● Extension Cable (See Fig.10)

	Type	Parts No.
1	Flat Cable for servicing 16Pin	QCNWK0110AFZZ
2	Extension Connector for Service 16Pin	RUNTK0460AFZZ

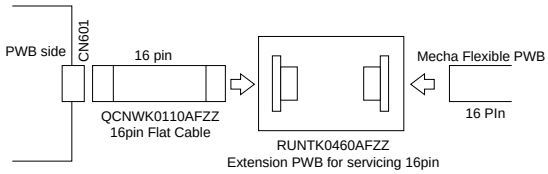


Figure 10

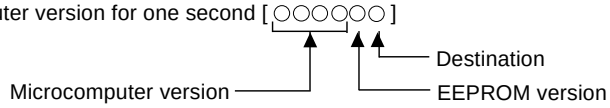
● Entering the TEST mode

1. Setting at port (in standby state, disc-free state or power nonconnected state)

(1) Set the port as follows.
TEST1 : "Low"
TEST0 : "High"
(2) Press the PLAY button in the standby state (it is allowed to insert the disc or to connect the power supply).
(3) Test Mode STOP [_ T E S T _]

2. Setting by special button operation (in standby state)

(1) Holding down the DISP button and ENTER button, press the PLAY button.
(2) Normal mode setting initialization (BASS setting, VOL setting, etc.)
(3) Indication of microcomputer version for one second [○○○○○○]



(4) Whole LCD lighting for 2 seconds
(5) Test Mode STOP [_ T E S T _]
*When the PLAY button is pressed during indication (3) and (4), the process proceeds to (5).

● Leaving the TEST mode

(1) Press the STOP button in the TEST mode stop state or version indicating state or whole LCD lighting state.
(2) EEPROM rewrite-enable area updating, adjustment error setting (so as to adjust all the items when the power supply is turned on in the normal mode)
(3) Change to standby state

● Test Mode

1. AUTO 1 Mode	• Perform preliminary automatic adjustment. • If the combination of mechanism and pickup PWB has been changed, be sure to start from AUTO1.
2. AUTO 2 Mode	• Perform ATT (attenuator) automatic adjustment. • Perform continuous playback (error rate display, jump test)
3. MANUAL 1 Mode	• Temperature is displayed. (Updating in real time) • Seeing the displayed adjustment value, perform preliminary manual adjustment. (Error rate indication, jump test)
4. MANUAL 2 Mode	• Temperature is displayed. (Updating in real time) • Seeing the displayed adjustment value perform manfully the preliminary adjustment. (Error rate indication, jump test) • Continuous playback is performed (error rate display, jump test).
5. RESULT 1 Mode	• The value adjusted in AUTO1 or MANUAL1 is indicated. • (Execution in servo "OFF" state").
6. RESULT 2 Mode	• The value adjusted in AUTO 2 or MANUAL 2 is indicated. • Adjustment value is changed manually. (error rate display, jump test).
7. TEST-PLAY Mode	• Continuous playback from the specified address is performed. • 1 line, 10 lines or 400 lines manual jump is performed. • C1 error rate display (pit section), ADIP error rate display (groove section) • The temperature correction is performed only when servo start is performed, but the posture correction is not performed during continuous playback.
8. TEST-REC Mode	• Continuous record from the specified address is performed. • Change of record laser output(servo gain is also changed according to laser output). • The temperature correction is performed only when servo start is performed, but the posture correction is not performed during continuous recording.
9. NORMAL Mode	• The mode is changed from the TEST mode to the normal mode without adjustment. • In the normal mode the internal operation mode, memory capacity, etc. areindicated. • In the normal mode both temperature correction and posture correction are perfomed.
10. DIGITAL INPUT mode	• Digital input information is displayed.
11. ERROR INFORMATION Mode	• Error information is displayed. • Error information is initialized
12. E^2-PROM Mode	• Factors of digital servo are changed manually. (Each servo is turned on individually.) • Cut-off frequency of BASS1, BASS2 and BASS3 is selected manually. • Temperature detection terminal voltage is measured, and the reference value is set. • Defaults are selected and set. • Setting of EEPROM protect area is updated. (In case of protect releasing)
13. INNER Mode	• Determine the position where the INNER switch is turned on. (only high reflection disc). • The temperature correction is performed only when servo start is performed, but the posture correction is not performed.

● Operation in each TEST mode

1. AUTO1 Mode

- When the STOP button is pressed while the AUTO1 menu appears or during automatic adjustment, the mode changes to the TEST mode stop state. At this time the adjustment value is not output.
- Be sure to adjust, using the specified disc MMD-212.
  At this time release the EEPROM (IC402) protection. (Refer to EEPROM write procedure.)
- Adjustment NG; Adjustment item out of range, focus ON failure, and adjustment error
- When the PLAY button is pressed while ADJ. OK is displayed, AUTO2 is executed.

2. AUTO2 Mode

- When the STOP button is pressed while the AUTO2 menu appears or during automatic adjustment, the mode changes to the TEST mode stop state. At this time the adjustment value is not output.
- Adjustment NG; Adjustment item out of range, and adjustment error

3. MANUAL1 Mode

- Adjustment item to be made in AUTO1 mode is performed manually.
- When the VOL UP button is pressed during adjustment, the setting increases, and the new setting is output.
- If the VOL DOWN button is pressed during adjustment, the setting decreases and the new setting is output.
- If the VOLUP/DOWN button is held down, the setting changes continuously with 100 ms cycle.
- If the setting is within the allowable range, the RANDOM display lights.
- When the STOP button is pressed during MANUAL1 MENU or measurement or adjustment, the state is changed to the TEST mode stop state.

4. MANUAL2 Mode

- Adjustment item to be made in AUTO2 mode is performed manually.
- When the VOL UP button is pressed during adjustment, the setting increases, and the new setting is output.
- If the VOL DOWN button is pressed during adjustment, the setting decreases and the new setting is output.
- If the VOLUP/DOWN button is held down, the setting changes continuously with 100 ms cycle.
- If the setting is within the allowable range, the RANDOM display lights.
- When the STOP button is pressed during MANUAL2 MENU or measurement or adjustment, the state is changed to the TEST mode stop state.
- When the PLAY button is pressed in B-ATT set state, the mode is changed to the continuous playback mode.
- As for operation during continuous playback refer to "TEST-PLAY mode explanation".

5. RESULT1 Mode

- The measurement value and set value of adjustment items for AUTO1 and MANUAL 1 are displayed.
- If the VOL UP button is pressed during setting indication, the setting increases. If the VOL DOWN button is pressed, the setting reduces. And then the new setting is stored in the RAM.
- When the VOL UP/DOWN button is held down, the setting changes continuously, one cycle being 100 ms.
- If the STOP button is pressed during RESULT1 menu or measurement value indication or set value indication, the state is changed to the TEST mode STOOP state.

6. RESULT2 Mode

- The measurement value and set value of adjustment items for AUTO2 and MANUAL 2 are displayed.
- If the VOL UP button is pressed during setting indication, the setting increases. If the VOL DOWN button is pressed, the setting reduces. And then the new setting is stored in the RAM.
- When the VOL UP/DOWN button is held down, the setting changes continuously, one cycle being 100 ms.
- If the STOP button is pressed during RESULT2 menu or measurement value indication or set value indication, the state is changed to the TEST mode STOOP state.

7. TEST-PLAY Mode

- When the STOP button is pressed while the TEST-PLAY menu appears, or in TEST-PLAY or continuous playback mode, the mode changes to the TEST mode stop state.
- When the PLAY button is pressed while the TEST-PLAY menu appears,continuous playback is initiated from the current pickup position.
- Whenever the DISP button is pressed in the TEST-PLAY mode, the address changes as follows.
  0050 — 03C0 — 0700 — 08A0 — 0050 —
- Whenever the BASS key is pressed in the TEST-PLAY mode, the digit which is changed by the SKIP UP/DOWN button changes as follows.
  0050 — 0050 — 0050 — 0050 — 0050 —
- When the SKIP UP button is pressed in the TEST-PLAY mode, the digit of address specified by the BASS button is set to +1h. (0 to F)
- When the SKIP DOWN button is pressed in the TEST-PLAY mode, the digit of address specified by the BASS button is set to -1h. (0 to F)
  * When the SKIP UP/DOWN button is held down, the setting changes continuously, one cycle being 100 ms.
- When the BASS button is pressed in the continuous playback mode, the number of jump lines changes as follows.
  1 — 10 — 400 — 1
  * After the number of jump lines is indicated for one second, the address indication is restored. [▲▲▲ T R _]
- When the SKIP UP button is pressed in the continuous playback mode, the specified number of lines is jumped in the FWD direction.
- When the SKIP DOWN button is pressed in the continuous playback mode, the specified number of lines is jumped in the REV direction.
  * When the SKIP UP/DOWN button is held down, jump is repeated every approx. 100 ms.

•Whenever the DISP button is pressed in the continuous playback mode, the indication changes as follows.

* Pit section

Continuous playback (SUBQ address indication) [S Q □□□□]
|
Continuous playback (C1 error indication) [C E ☆☆☆☆]
|
Continuous playback (SUBQ address indication) [S Q □□□□]

* Groove section

Continuous playback (ADIP address indication) [A P □□□□]
|
Continuous playback (C1 error indication) [C E ☆☆☆☆]
|
Continuous playback (ADIP error indication) [A E ★★★★]
|
Continuous playback (ADIP address indication) [A P □□□□]

8. TEST-REC Mode

- When the STOP button is pressed while the TEST-REC menu appears, or in the TEST-REC mode or continuous record mode, the mode changes to the TEST mode stop state.
- When the PLAY button is pressed while the TEST-REC menu appears, the continuous record is initiated from the current pickup position.
- Whenever the DISP button is pressed in the TEST-REC mode, the address changes as follows.
  0050 — 03C0 — 0700 — 08A0 — 0050 —
- Whenever the BASS button is pressed in the TEST-REC mode, the digit which is changed by the SKIP UP/DOWN button changes as follows.
  0050 — 0050 — 0050 — 0050 — 0050 —
- When the SKIP UP button s pressed in the TEST-REC mode, the digit of address specified by the BASS button is set to +1h.(0 to F)
- When the SKIP DOWN button is pressed in the TEST-REC mode, the digit of address specified by the BASS button is set to -1h. (0 to F)
  * When the SKIP UP/DOWN button is held down, the setting changes continuously, one cycle being 100 ms.
- When the VOL UP/DOWN button is pressed in the TEST-REC mode or continuous record mode, the laser record power changes. (Servo gain changes also according to record power.)
  * After the laser record power is indicated for one second, the address indication is restored. [R P W ▽▽]

•□□□□ : Address
•▽▽ : Laser power cord

- Operation is disabled if the premastered disc or disc is in miserase-protected state.

9. NORMAL Mode

- When the STOP button is pressed while the NORMAl menu appears, the mode changes to the TEST mode stop state.
- Indication during operation
  Indication of memory capacity on main unit LCD [□□ _ ✳✳✳✳ _ ✳✳] + Level meter
  □□ : Internal mode
  ✳✳✳✳ : Address (Cluster section)
  ✳✳ : Address (Sector section)
- Selection of sound volume, BASS, etc. is possible (without indication)
- Recording is also possible.

10. Digital input display Mode (Din Mon)

- When the STOP button is pressed while the digital input indication menu appears or during digital input information indication, the mode changes to the TEST mode stop state.
- In case of analog input or digital input unlocking the indication data is _.

11. Error data display Mode

- Reversing when SKIP DOWN button is pressed
- When the STOP button is pressed while the error data indication menu appears or during error data indication, the mode changes to the TEST mode stop state.
- Error data 0 is the latest error.
- Error which occurred in the TEST mode is also stored in the memory.
- When the DISP button is pressed while the error data indication menu appears, the error data is initialized. [C L E A R _]
- ◇◇: Error Code

● Explanation of error history code

12h : RF side FG, TG, and TCRS adjustment termination failure
13h : Adjustment servo retraction excessive retrial
17h : A, B, E, F, and TCRSO offset measurement value out of tolerable range
21h : Focus retraction completion allowable time-over
23h : Track search completion allowable time-over
32h : P-TOC read failure
42h : U-TOC read failure
44h : U-TOC write data write disabled/read check error
52h : SD write data write disabled
71h : Pickup position initialization time-over

72h : EEPROM data read check sum error
73h : Record head drive disabled (by EJECT lever)
82h : Power overvoltage detection
91h : Ambient temperature is higher that the allowable temperature.

12. INNER Mode

• when the STOP button is pressed on the INNER menu (SQ□□□□), the state is changed to the TEST mode STOP state.
• □□□□ : Address

E²-PROM (IC402) writing procedure

1. Procedure to replace E²-PROM and write initial value of microcomputer in E²-PROM

(1) Replace E²-PROM.
(2) Deprive E²-PROM of protection (connect the pins 8 and 6 of IC402).
(3) Refer to the latest E²-PROM data list.
(4) Press the Display/Lower-case Character button, Enter/Synchro button and Play/Pause button to start the test mode.
(5) Version display
[V e r . ✳✳✳✳✳✳]
E²-PROM version (C ~ Z)
Microcomputer ROM version
(6) The whole LCD lights.
(7) Test mode stop state
[T E S T]
(8) Press the "BASS" button, and press twice the "SKIP DOWN" button.
[E E P R O M]
(9) Perform the operation to display "E²-PROM SETTING MODE CHART", compare the E²-PROM DATA LIST with the display, and set according to the E²-PROM DATA LIST with the VOL UP or VOL DOWN key.
(10) Set the temperature reference. (Refer to the Temperature Reference Setting Method.)
(11) Set according to the E²-PROM DATA LIST.
(12) Press the Stop button.
[T E S T]
(13) Press the Stop button.
(14) After data is written in E²-PROM, turn off power .
(15) Restore protection of E²-PROM (Disconnect connection made in Step (2) above).

2. Temperature reference setting method

[1] Measurement, calculation and setting procedure

(1) Set the TEST mode.
• Set TEST 1, 0 = '01', and turn on power (or set PLAY ON in standby state).
(2) Start the EEPROM mode 'Temp' menu.
• In the TEST mode STOP state, press the keys as follows: BASS, SKIP-DOWN x 2 times, PLAY, SKIP-DOWN x 4 times, and PLAY in this order.
• 'TM$$%%' is displayed. ($$= Temperature code, %% = Temperature reference)
(3) Once press SKIP-UP, and determine the displayed microcomputer TEMP input AD value.
• 'TPin##' is displayed. (## = TEMP input AD value)
(4) At the ambient temperature, determine the temperature corrected value from the temperature measurement value correction table.
(5) Determine the temperature reference, using the following formula.
• Temperature reference = Microcomputer TEMP input AD value + Temperature corrected value
• An example: Environmental temperature is 22°C and set voltage is 1.25V.

[2] Temperature measurement value correction table

Ambient temperature	Temperature correction	Center temperature
+14°C ~ +16°C	- 03h	+ 15.0°C
+17°C ~ +19°C	- 02h	+ 17.8°C
+20°C ~ +22°C	- 01h	+ 20.7°C
+23°C ~ +25°C	± 00h	+ 23.6°C
+26°C ~ +27°C	+ 01h	+ 26.5°C
+28°C ~ +30°C	+ 02h	+ 29.4°C

*Meaning of values
- Temperature reference = Value to be predicted to be measured by the microcomputer at reference temperature (+23.6°C)
- Temperature correction = Value to convert to measurement value at reference temperature (+23.6¯C)

*Determining the temperature correction value
- Temperature detection characteristics formula
  Ambient temperature (°C) = (-2.876 x TEMP input AD value) + 463
  Hence, TEMP input AD value = (463 - Ambient temperature)/2.876
- The reference temperature (+23.6°C) is taken as a reference. (it is taken as '0'). Whenever the input AD value changes by '1', temperature is determined.
  For temperature correction, the input AD value is +/- inverted.

[3] Power IC VREF feed control output
- Test/R-ROM write power input

Ambient temperature	Temperature correction	Center temperature
-5°C ~ +9°C	08h	+ 0.5°C
+6°C ~ +21°C	07h	+ 12.5°C
+17°C ~ +32°C	06h	+ 23.6°C
+29°C ~ +44°C	05h	+ 35.0°C

● E^2-PROM DATA LIST

TEMP setting

Item display		Set values
T M _ _	○ ○	Calculate values

BASS setting

Item display		Set values
B S 1 _	○ ○	02H
B S 2 _	○ ○	A4H
B S 3 _	○ ○	C4H

Fucus setting

Item display		Set values
F G _ _	○ ○	63H
F F 1 _	○ ○	70H
F F 2 _	○ ○	F0H
F Z H _	○ ○	EDH
F L n _	○ ○	09H
D J G _	○ ○	14H
F R V _	○ ○	00H
F P f _	○ ○	88H
F L V _	○ ○	19H
W T f _	○ ○	20H
F S S _	○ ○	02H

Tracking setting

Item display		Set values
T G _ _	○ ○	26H
T F 1 _	○ ○	70H
T F 2 _	○ ○	E0H
T F S _	○ ○	00H
T B o _	○ ○	2BH
T B t _	○ ○	17H
T K o _	○ ○	2BH
T K t _	○ ○	19H
T D o _	○ ○	67H
T D t _	○ ○	2AH
S C o _	○ ○	00H
S C t _	○ ○	40H
S C m _	○ ○	53H
D B O _	○ ○	00H
C L p _	○ ○	12H
C L r _	○ ○	24H
W T m _	○ ○	E0H

Spindle setting

Item display		Set values
S P G _	○ ○	14H
S P i _	○ ○	AAH
S P m _	○ ○	79H
S P o _	○ ○	4FH
S P 1 _	○ ○	10H
S P 2 _	○ ○	60H
S P 3 _	○ ○	F2H
S P 4 _	○ ○	F2H
S P 5 _	○ ○	10H
S P D _	○ ○	61H
S P R _	○ ○	C4H

Sled setting

Item display		Set values
S L G _	○ ○	94H
S L 2 _	○ ○	30H
S L M _	○ ○	4FH
S L V _	○ ○	36H
S K k _	○ ○	43H
S K t _	○ ○	40H
S K m _	○ ○	43H

ADJ. SET setting

Item display		Set values
C O K _	○ ○	A0H
F A T _	○ ○	C0H
T A T _	○ ○	3FH
C A T _	○ ○	20H
F A B _	○ ○	00H

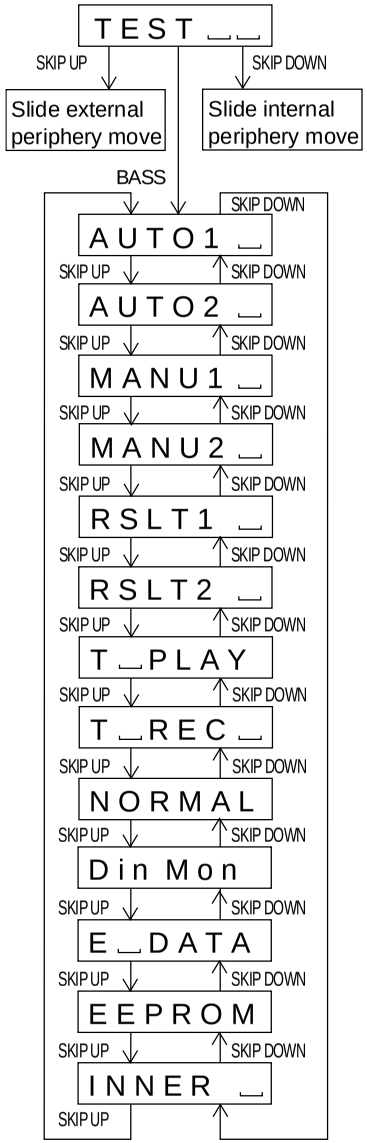
EQ. SET setting

Item display		Set values
H Q 1 _	○ ○	90H
H Q 2 _	○ ○	90H
H S G _	○ ○	11H
H S O _	○ ○	FDH
L Q 1 _	○ ○	90H
L Q 2 _	○ ○	90H
L S G _	○ ○	11H
L S O _	○ ○	00H
G Q 1 _	○ ○	98H
G Q 2 _	○ ○	84H
G S G _	○ ○	11H
G S O _	○ ○	00H
G Q R _	○ ○	00H

Control setting

Item display		Set values
C T 0 _	○ ○	48H
C T 1 _	○ ○	E0H
P W L _	○ ○	00H
R C 0 _	○ ○	C0H
R C 1 _	○ ○	FEH
S Y C _	○ ○	A6H
D R 1 _	○ ○	A0H
D R 2 _	○ ○	A6H
I N 1 _	○ ○	D4H
I N 2 _	○ ○	67H
C T R _	○ ○	6DH
C T 2 _	○ ○	14H
C T 3 _	○ ○	03H
C T 4 _	○ ○	64H
C T 5 _	○ ○	74H
C T 6 _	○ ○	08H
C T 7 _	○ ○	00H
S P M _	○ ○	00H
M S L _	○ ○	80H
R S L _	○ ○	00H

Test Mode Change Chart
Tset Mode Menu



: Test Mode STOP

: Pre-autoadjustment menu

: ATT autoadjustment menu

: Pre-manual adjustment menu

: ATT manual adjustment menu

: Preadjustment value check menu

: ATT adjustment value check menu

: Continuous playback menu

: Continuous record menu (record/playback machine only)

: Test mode normal playback menu

: Digital input signal monitor menu (record/playback machine only)

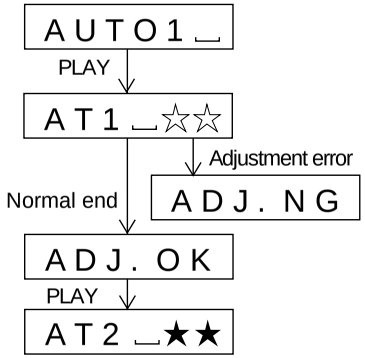
: Error history display menu

: EEPROM setting menu

: INNER switch position measurement menu

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.

Preautomatic Adjustment



: Preautomatic Adjustment menu

: During preadjustment adjustment

: Preadjustment error (adjustment value output)

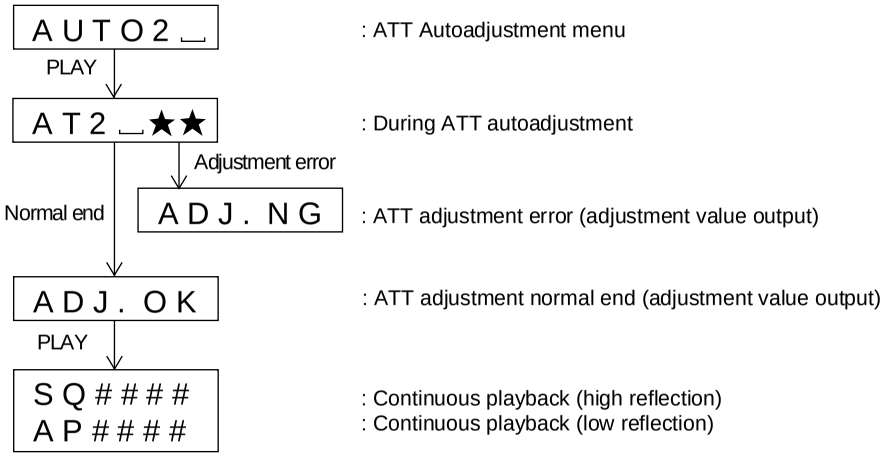
: Preadjustment normal end (adjustment value output)

: During ATT automatic adjustment

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* "☆☆" represent the adjustment number as follows.

0 0 : Innermost periphery move
0 2 : ABEF offset tentative measurement
0 4 : RF side focus gain coarse adjustment
0 5 : Focus ATT tentative setting
0 6 : RF side bit section tracking gain adjustment
0 7 : COUT level setting for pit section adjustment
0 8 : External periphery move
0 9 : RF side groove section tracking gain adjustment
1 0 : COUT level setting for groove section adjustment
1 1 : RF side TCRS gain adjustment
1 2 : Tracking ATT initial setting
1 3 : RF side focus gain minor adjustment
1 4 : Focus ATT initial setting
1 5 : S gain "High" ABEF offset measurement
1 6 : TCRS offset measurement
1 7 : S gain "Low" ABEF offset measurement

ATT Autoadjustment



: ATT Autoadjustment menu

: During ATT autoadjustment

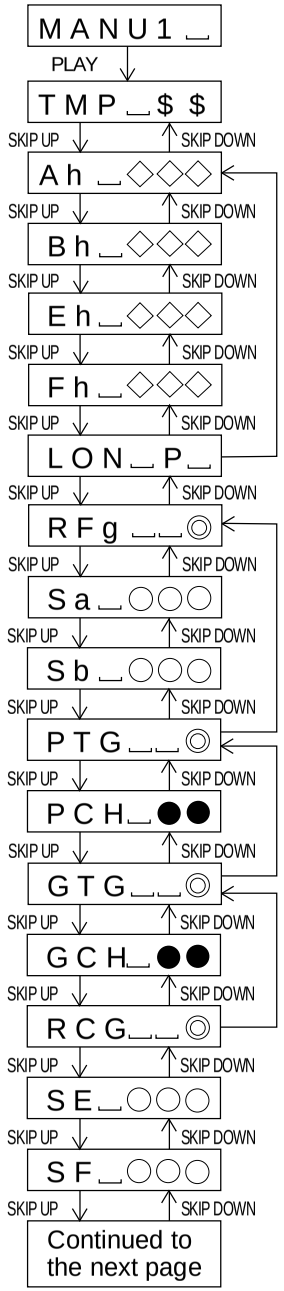
: ATT adjustment error (adjustment value output)

: ATT adjustment normal end (adjustment value output)

: Continuous playback (high reflection)
: Continuous playback (low reflection)

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* "★★" represent the adjustment number as follows.
  - 0 0 : Innermost periphery move
  - 0 3 : Pit section tracking ATT setting
  - 0 4 : Pit section focus ATT setting
  - 0 6 : External periphery move (low reflection only)
  - 0 7 : TCRS ATT setting (low reflection only)
  - 0 8 : Groove section tracking ATT setting (low reflection only)
  - 0 9 : Groove section focus ATT setting (low reflection only)

Pre-Manual Adjustment



: Pre-Manual Adjustment menu

: Temperature code display
  $ $: Temperature code

: A signal offset (AINO) tentative measurement
  ◇◇◇: Measurement value

: B signal offset (BINO) tentative measurement
  ◇◇◇: Measurement value

: E signal offset (EINO) tentative measurement
  ◇◇◇: Measurement value

: F signal offset (FINO) tentative measurement
  ◇◇◇: Measurement value

: Laser On (Play Power)

: RF side focus gain coarse adjustment
  ◎: Gain setting

: A-ATT (focus) tentative setting
  ○○○ : ATT setting

: B-ATT (focus) tentative setting
  ○○○ : ATT setting

: RF side pit section tracking gain adjustment
  ◎: Gain setting

: Pit section adjustment COUT level setting
  ●● : COUT level setting

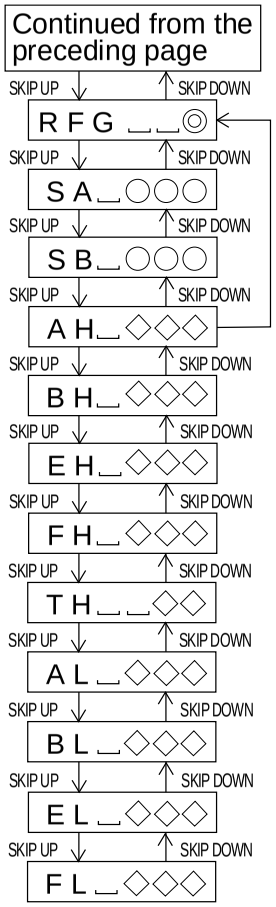
RF side groove section tracking gain adjustment
  ◎: Gain setting

: Groove section adjustment COUT level setting
  ●● : COUT level setting

: RF side TCRS gain adjustment
  ◎: Gain setting

: E-ATT (tracking) initial setting
  ○○○ : ATT setting

: F-ATT (tracking) initial setting
  ○○○ : ATT setting



: RF side focus gain minor adjustment
◎ : Gain setting

: A-ATT (focus) initial setting
: ATT setting

: B-ATT (focus) initial setting
○○○ : ATT setting

: S gain "High" A signal offset (AINO) measurement
◇◇◇ : Measurement value

: S gain "High" B signal offset (BINO) measurement
◇◇◇ : Measurement value

: S gain "High" E signal offset (EINO) measurement
◇◇◇ : Measurement value

: S gain "High" F signal offset (FINO) measurement
◇◇◇ : Measurement value

TCRS signal offset (TCRSO) measurement
◇◇ : ATT setting

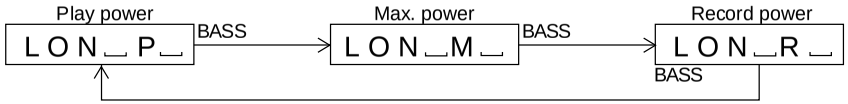
: S gain "Low" A signal offset (AINO) measurement
◇◇◇ : Measurement value

: S gain "Low" B signal offset (BINO) measurement
◇◇◇ : Measurement value

: S gain "Low" E signal offset (EINO) measurement
◇◇◇ : Measurement value

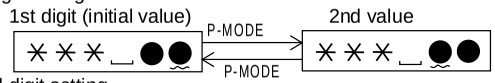
: S gain "Low" F signal offset (FINO) measurement
◇◇◇ : Measurement value

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In laser ON state (without disc) the laser power is changed as follows when the [BASS] key is pressed.

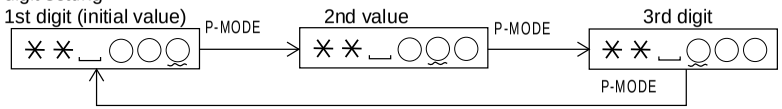


* In the specific setting display state the setting change digit changes when the [P-MODE] key is pressed.
(In case of RF side gain setting change does not occur since there is only one digit.)

• 2-digit setting

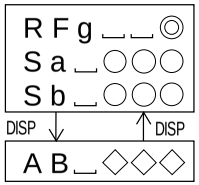


• 3-rd digit setting



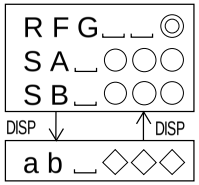
* In the setting display sate the value of selected digit changes in the range of "0h to Fh" when [VOL UP/DOWN] key is pressed.
However, the RF side gain setting changed in the range of "0h to 6h".
* When the [DISP] key is pressed, the display changes as follows.

• ABMAXO Measurement value



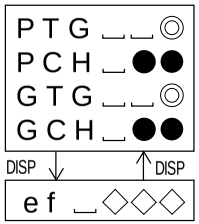
: RF side focus gain coarse adjustment
: A-ATT (focus) tentative setting
: B-ATT (focus) tentative setting
: ABMXO measurement value display
"REPEAT" mark lighting

• LPFABO Measurement value



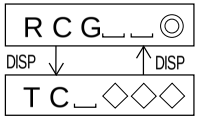
: RF side focus gain coarse adjustment
: A-ATT (focus) initial setting
: B-ATT (focus) initial setting
: LPFABO measurement value display
"REPEAT" mark lighting

• LPFEFO Measurement value



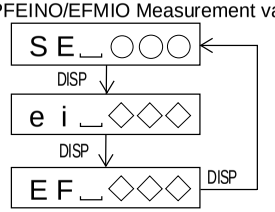
: RF side pit section tracking gain adjustment
: Pit section adjustment COUT level setting
: RF side groove section tracking gain adjustment
: Groove section adjustment COUT level setting
: LPFEFO measurement value display
"REPEAT" mark lighting

• TCRSMIO Measurement value



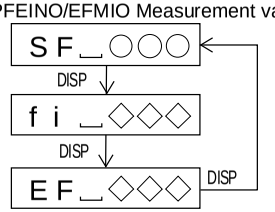
: RF side TCRS gain adjustment
: TCRSMIO measurement value display
"REPEAT" mark lighting

• LPFEINO/EFMIO Measurement value



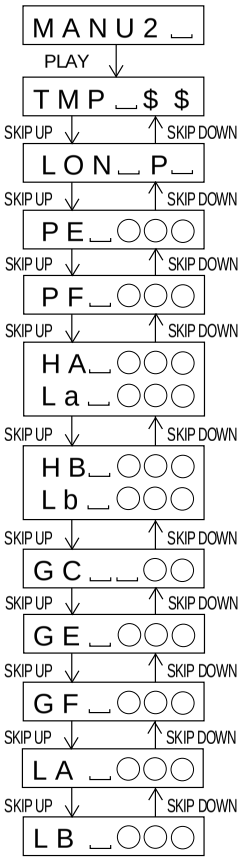
: E-ATT (tracking) initial setting
: LPFEINO measurement value display
"REPEAT" mark lighting
: EFMIO measurement value display
"REPEAT", "1" mark lighting

• LPFEINO/EFMIO Measurement value



: F-ATT (tracking) initial setting
: LPFEINO measurement value display
"REPEAT" mark lighting
: EFMIO measurement value display
"REPEAT", "1" mark lighting

ATT Manual Adjustment



: Temperature code displayATT manual adjustment menu

: Temperature code display
$ $: Temperature code

: Laser ON (Play Power)

: Pit section E-ATT (tracking) setting
○○○ : ATT setting

: Pit section E-ATT (tracking) setting
○○○ : ATT setting

: High reflection: A-ATT (focus) setting
: Low reflection: A-ATT (focus) setting
○○○ : ATT setting

: High reflection: B-ATT (focus) setting
: Low reflection: B-ATT (focus) setting
○○○ : ATT setting

: TCRS ATT setting
○○ : ATT setting

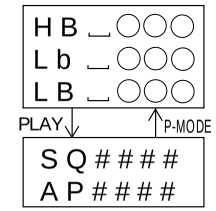
:Groove section E-ATT (tracking) setting
○○○ : ATT setting

:Groove section F-ATT (tracking) setting
○○○ : ATT setting

: Low reflection: A-ATT (focus) setting
○○○ : ATT setting

: Low reflection: B-ATT (focus) setting
○○○ : ATT setting

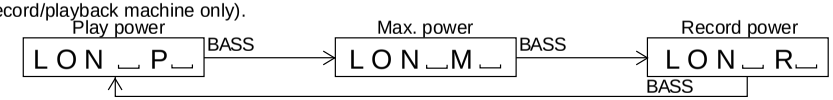
* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In B-ATT setting state, the continuous playback is started when the [PLAY] key is pressed. When in the continuous playback state the ATT manual adjustment B-ATT setting state is started when the [P-MODE] key is pressed in continuous playback state.



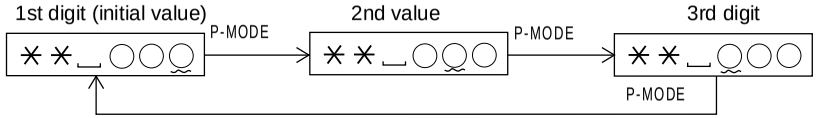
: High reflection pit section B-ATT (focus) setting
: Low reflection pit section B-ATT (focus) setting
: Low reflection groove section B-ATT (focus) setting
○○○ : ATT setting

Continuous playback (pit section)
Continuous playback (groove section)
: Address

* In laser ON state (without disc) the laser power is changed as follows if the [BASS] key is pressed (record/playback machine only).

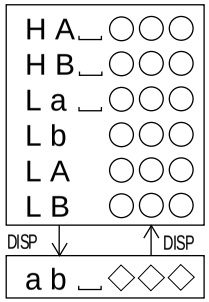


* In the specific setting display state the setting change digit changes when the [P-MODE] key is pressed.



* In the specific setting display state the selection digit value changes in the range of "0h to Fh" when [VOL UP/DOWN] key is operated.
* When the [DISP] key is pressed, the display changes as follows.

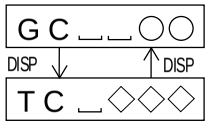
• LPFABO Measurement value



: High reflection pit section A-ATT (focus) setting
: High reflection pit section B-ATT (focus) setting
: Low reflection pit section A-ATT (focus) setting
: Low reflection pit section B-ATT (focus) setting
: Low reflection groove section A-ATT (focus) setting
: Low reflection groove section B-ATT (focus) setting

: LPFABO measurement value display
"REPEAT" mark lighting

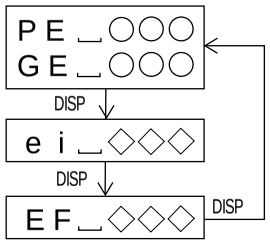
• TCRSMIO Measurement value



: TCRS ATT setting

: TCRSMIO measurement value display
"REPEAT" mark lighting

• LPFEINO/FEMIO Measurement value

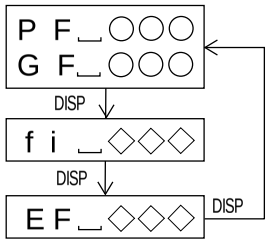


: Pit section E-ATT (tracking) setting
: Groove section E-ATT (tracking) setting

: LPFEINO measurement value display
"REPEAT" mark lighting

: EFMIO measurement value display
"REPEAT", "1" mark lighting

• LPFEINO/FEMIO Measurement value

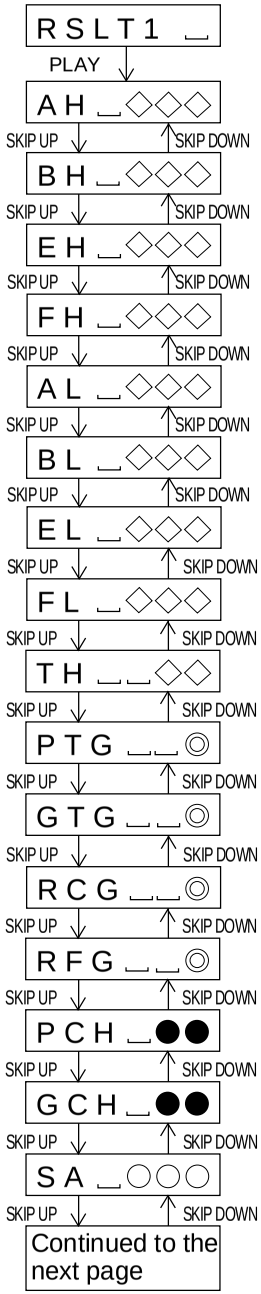


: Pit section F-ATT (tracking) setting
: Groove section F-ATT (tracking) setting

: LPFEINO measurement value display
"REPEAT" mark lighting

: EFMIO measurement value display
"REPEAT", "1" mark lighting

Pre-Adjustment Value Check



: Pre-Adjustment Value Check menu

: S gain "High" A signal offset measurement value (setting)

: S gain "High" B signal offset measurement value (setting)

: S gain "High" E signal offset measurement value (setting)

: S gain "High" F signal offset measurement value (setting)

: S gain "Low" A signal offset measurement value (setting)

: S gain "Low" B signal offset measurement value (setting)

: S gain "Low" E signal offset measurement value (setting)

: S gain "Low" F signal offset measurement value (setting)

: TCRS signal offset measurement value

: RF side pit section tracking gain setting

: RF side groove section tracking gain setting

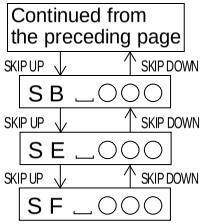
: RF side TCR gain setting

: RF side focus gain setting

: Pit section adjustment COUT level setting

: Groove section adjustment COUT level setting

: A-ATT (focus) initial setting



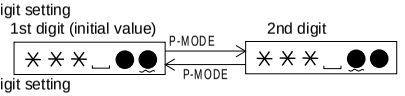
: B-ATT (focus) initial setting

: E-ATT (tracking) initial setting

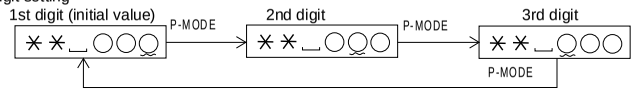
: F-ATT (tracking) initial setting

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In the specific setting display state the setting change digit changes when the [P-MODE] key is pressed.
(For RF side gain setting only one digit is provided. Therefore change does not occur.)

• 2-digit setting

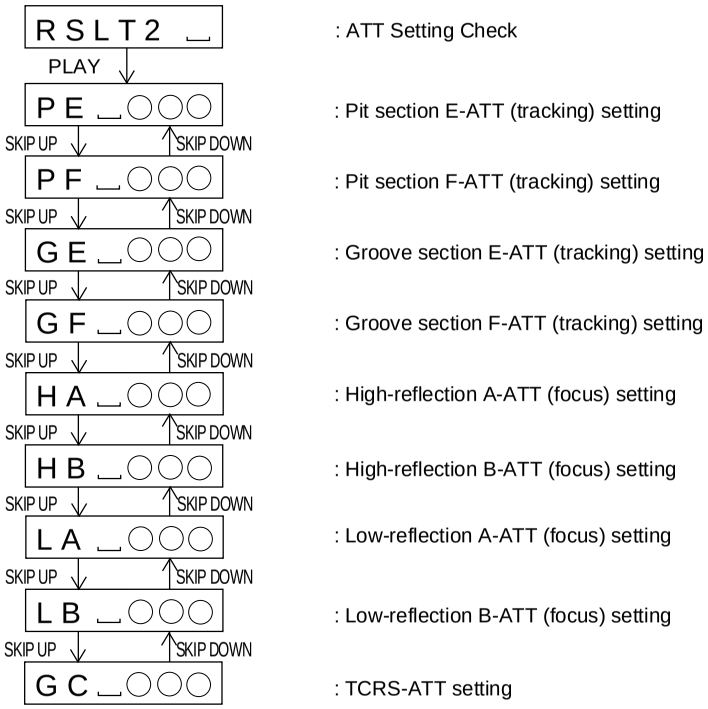


• 3-digit setting



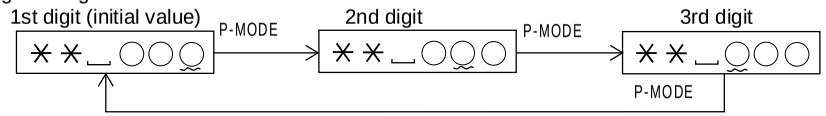
* In the specific setting display state the value of selected digit changes in the range of "0h to Fh" when the [VOL UP/DOWN] key is pressed.
However, the RF side gain setting changes in the range of "0h to 6h".

ATT Setting Check



: ATT Setting Check
: Pit section E-ATT (tracking) setting
: Pit section F-ATT (tracking) setting
: Groove section E-ATT (tracking) setting
: Groove section F-ATT (tracking) setting
: High-reflection A-ATT (focus) setting
: High-reflection B-ATT (focus) setting
: Low-reflection A-ATT (focus) setting
: Low-reflection B-ATT (focus) setting
: TCRS-ATT setting

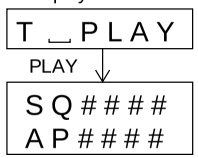
* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In the specific setting display state the setting change digit changes when the [P-MODE] key is pressed.
  • 3-digit setting



* In the specific setting display state the value of selection digit changes in the range of "0h to Fh" when the [VOL UP/DOWN] key is pressed.

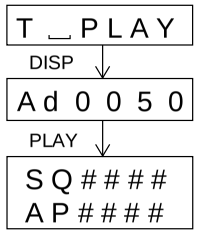
Continuous Playback

• Continuous playback from current pickup position



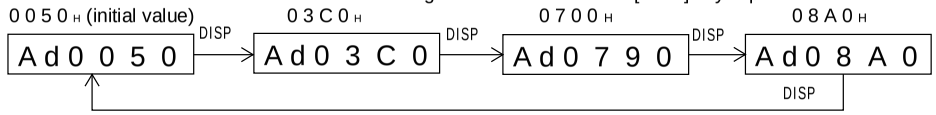
: Continuous playback menu
: Continuous playback (pit section)
: Continuous playback (groove section)
: Address

• Continuous playback from any address

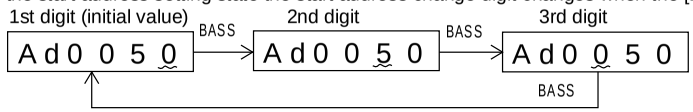


: Continuous playback menu
: Start address setting
: Continuous playback (pit section)
: Continuous playback (groove section)
: Address

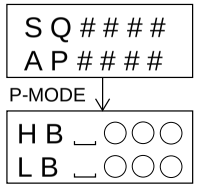
* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In the start address set state the start address changes as follows when the [DISP] key is pressed.



* In the start address setting state the start address change digit changes when the [BASS] key is pressed.

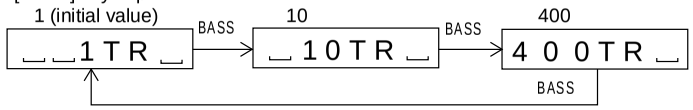


* In the start address set state the value of selection digit changes in the range of "0h to Fh" when the [SKIP UP/DOWN" key is pressed.
* In the continuous playback state the state is changed to ATT manual adjustment B-ATT setting state when the [P-MODE] key is pressed.



: Continuous playback (pit section)
: Continuous playback (groove section)
: Address
: High reflection pit section B-ATT (focus) setting
: High reflection groovesection B-ATT (focus) setting
○○○: ATT setting

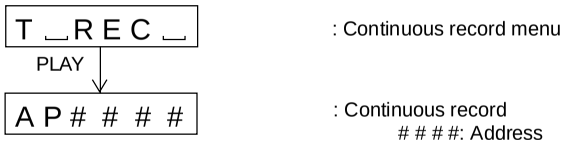
* In the continuous playback state the number of jump lines changes as follows shown the [BASS] key is pressed.



* In the continuous playback state, jump ocurs in the specified number external periphery direction. If the key is held down, jump occurs continuously with 100 ms period.

Continuous Rrecord

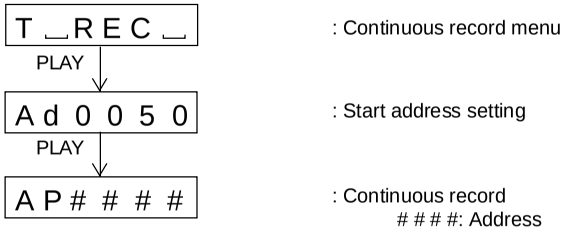
• Continuous record from the current pickup position



: Continuous record menu

: Continuous record
#: Address

• Continuous record playback from any address

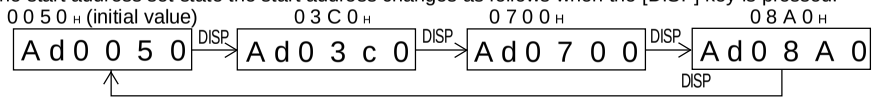


: Continuous record menu

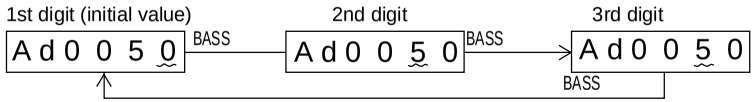
: Start address setting

: Continuous record
#: Address

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In the start address set state the start address changes as follows when the [DISP] key is pressed.

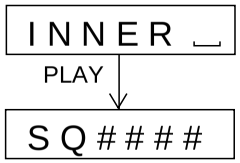


* In the start address setting state the start address change digit changes when the [BASS] key is pressed.



* In the start address set state the value of selection digit changes in the range of 0h to Fh wh
en the [SKIP UP/DOWN] key is pressed.
* In the continuous record state and start address set state the record laser power changes in t
he range of "0h to Fh" when the [VOL UP/DOWN] key is pressed.

Inner Switch Position Measurement

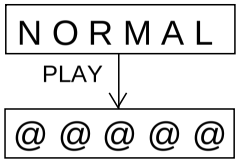


: INNER switch position measurement menu

: Continuous playback (pit section)
: Address

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.

Test Mode Normal Playback

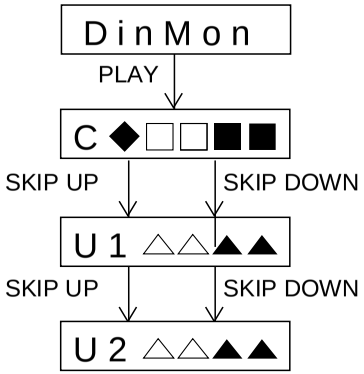


: TEST mode normal playback menu

: Continuous playback
@@@@@: Mode and address display

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.

Digital Input Signal Monitor



: Digital input single monitor menu

: FS code, C bit data display
◆: Address
□□: Control code
■■: Category code

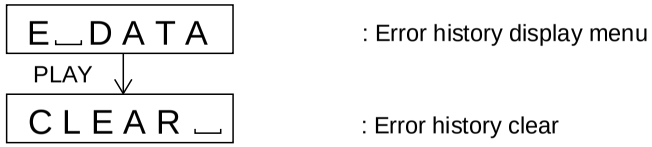
: U bit 1 data display
△△: TNO
▲▲: INDEX

: U bit 2 data display
▽▽: TIME (min.)
▼▼: TIME (sec.)

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.

Error History Display

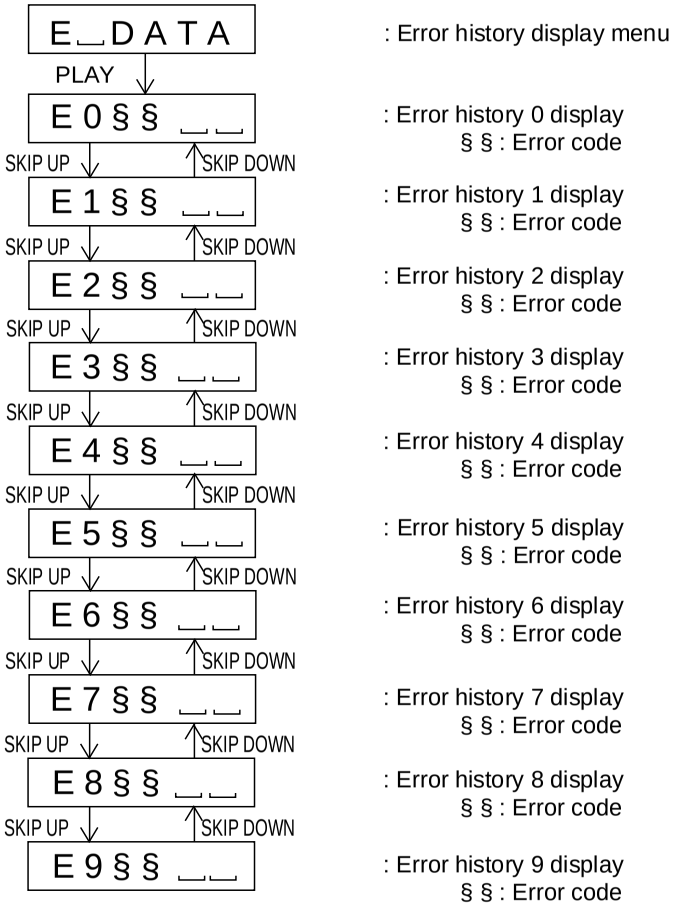
• Error history clear



: Error history display menu

: Error history clear

• Error history display



: Error history display menu

: Error history 0 display
§ § : Error code

: Error history 1 display
§ § : Error code

: Error history 2 display
§ § : Error code

: Error history 3 display
§ § : Error code

: Error history 4 display
§ § : Error code

: Error history 5 display
§ § : Error code

: Error history 6 display
§ § : Error code

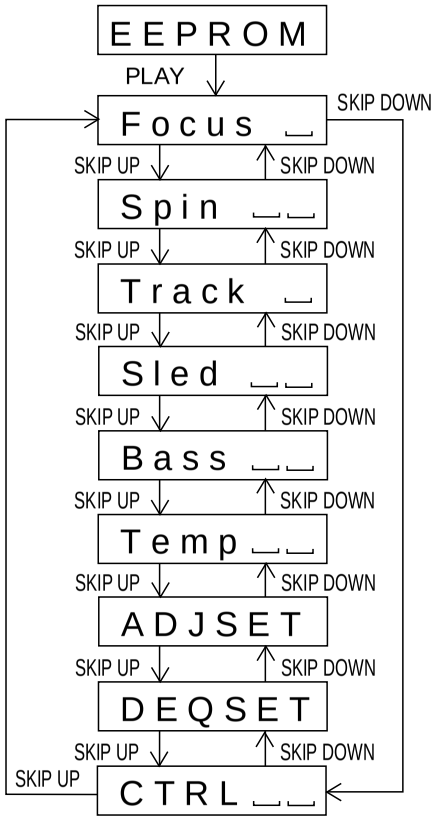
: Error history 7 display
§ § : Error code

: Error history 8 display
§ § : Error code

: Error history 9 display
§ § : Error code

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.

EEPROM Setting



: EEPROM setting menu

: Focus setting menu

: Spin setting menu

: Tracking setting menu

: Sled setting menu

: BASS setting menu

: TEMP setting menu

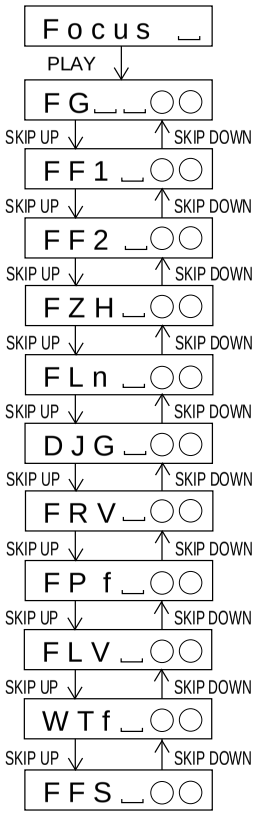
: Adjustment setting menu

: Digital EQ setting menu

: Control setting menu

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.

Focus Setting



: Focus setting menu

: Focus system loop filter gain constant setting
○○: setting

: Focus system loop filter f-characteristics constant 1 setting
○○: setting

Focus system loop filter f-characteristics constant 2 setting
○○: setting

: FZC detection hysteresis level setting
○○: setting

: FOK generation comparison level setting (normal)
○○: setting

: DISC-ID judgment high-reflection lower-limit level
○○: setting

: Focus-related other settings
○○: setting

: FOK generation LPF factor setting (when focus "ON")
○○: setting

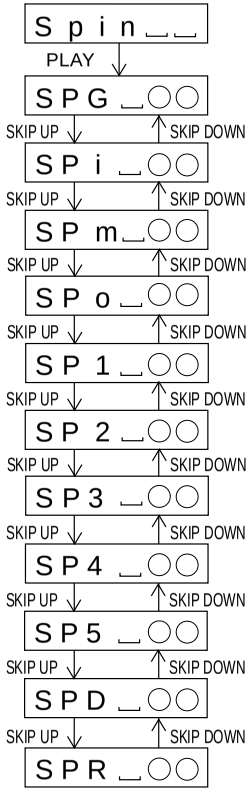
: Focus servo amptitude
○○: setting

: Auto-focus retraction waiting time setting
○○: setting

: Focus search inclination
○○: setting

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In the specific state pressing the [DISP] key causes change to "focus setting menu".
* In specific state the setting changed in the range of "00h to FFh" when the [VOL UP/DOWN" key is pressed.
(The upper limit varies depending on the items)

Spin Setting



: Spin setting menu

: Spin system loop filter gain constant setting (until servo is turned on)
○○: setting

: Spin system loop filter again constant setting
(after servo is turned on, internal periphery)
○○: setting

: Spin system loop filter gain constant setting (after servo is turned on, center)
○○: setting

: Spin system loop filter gain constant setting
(after servo is turned on, externalperiphery)
○○: setting

: Spin system loop filter f-chracteristics constant 1 setting
○○: setting

Spin system loop filter f-chracteristics constant 2 setting
○○: setting

Spin system loop filter f-chracteristics constant 3 setting
○○: setting

Spin system loop filter f-chracteristics constant 4setting
○○: setting

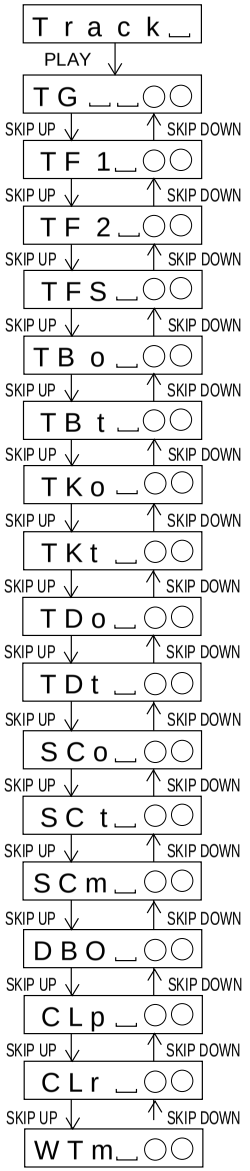
Spin system loop filter f-chracteristics constant 5 setting
○○: setting

: Spin drive PWM duty limiter setting
○○: setting

: Spin-related other settings
○○: setting

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In the specific state pressing the [DISP] key causes change to "focus setting menu".
* In specific state the setting changed in the range of "00h to FFh" when the [VOL UP/DOWN" key is pressed.
(The upper limit varies depending on the items)

Tracking setting



: Tracking setting menu

: Tracking system loop filter gain constant setting (normal)
○○: setting

: Tracking system loop filter f-characteristics constant 1 setting (normal)
○○: setting

: Tracking system loop filter f-characteristics constant 2 setting (normal)
○○: setting

: Tracking system filter selection switch setting
○○: setting

: Tracking brake level setting (1 line jump)
○○: setting

: Tracking brake level setting (10 line jump)
○○: setting

: Tracking kick level setting (1 line jump)
○○: setting

: Tracking kick level setting (10 line jump)
○○: setting

: Tracking drive pulse width time setting (1 line jump)
○○: setting

: Tracking drive pulse width time setting (10 line jump)
○○: setting

: Tracking slip stop time setting (1 line jump)
○○: setting

: Tracking slip stop time setting (10 line jump)
○○: setting

: Tracking slip stop time setting (move)
○○: setting

: PWM output offset setting
○○: setting

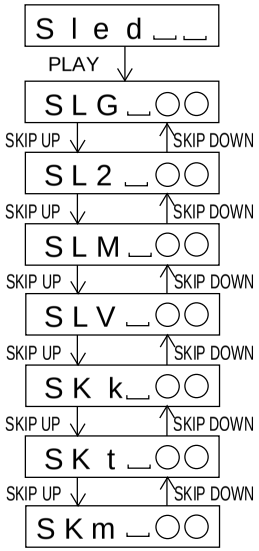
: COUT generation comparison level setting (PLAY)
○○: setting

COUT generation comparison level setting (REC)
○○: setting

Auto-move waiting time setting
○○: setting

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In the specific state pressing the [DISP] key causes change to "focus setting menu".
* In the specific state the setting changes in the range of "00h to FFh"
  when the [VOL UP/DOWN] key is pressed.
  (The upper limit varies depending on the items)

Slide Setting



: Slide setting menu

: Slide system loop filter gain constant setting
○○: setting

: Slide system filter specific constant 2 setting
○○: setting

: Slide drive PWM duty limiter setting
○○: setting

: Slide serve output dead zone level setting
○○: setting

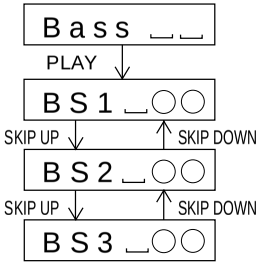
: Slide kick pulse level setting (forced shift)
○○: setting

: Slide kick pulse level setting (for 10 lines jump auxiliary)
○○: setting

: Slide kick pulse level setting (move)
○○: setting

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In the specific state pressing the [DISP] key causes change to "focus setting menu".
* In the specific state the setting changes in the range of "00h to FFh"
  when the [VOL UP/DOWN] key is pressed.
  (The upper limit varies depending on the items)

BASS setting



: BASS setting menu

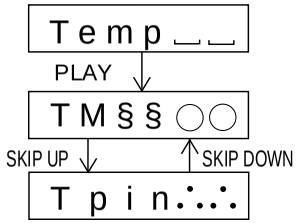
: BASS1 characteristics setting
○○: setting

: BASS2 characteristics setting
○○: setting

: BASS3 characteristics setting
○○: setting

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In the specific state pressing the [DISP] key causes change to "focus setting menu".
* In the specific state the setting changes in the range of "00h to FFh"
  when the [VOL UP/DOWN] key is pressed.
  (The upper limit varies depending on the items)

TEMP Setting



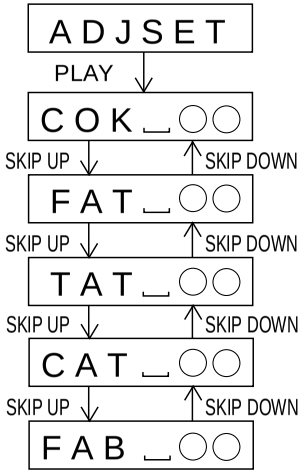
: Temp setting menu

: TEMP setting
○○: setting
§ § : Temperature code

: TEMP A/D input value
∴∴ : Measurement value

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In the specific state pressing the [DISP] key causes change to "focus setting menu".
* In the specific state the setting changes in the range of "00h to FFh" when the [VOL UP/DOWN] key is pressed.

Adjustment Setting



: Adjustment setting menu

: Adjustment COUT level reference value
○○: setting

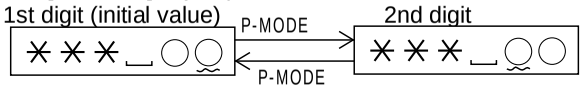
: Focus ATT reference value
○○: setting

: Tracking ATT reference value
○○: setting

: TCRS ATT reference value
○○: setting

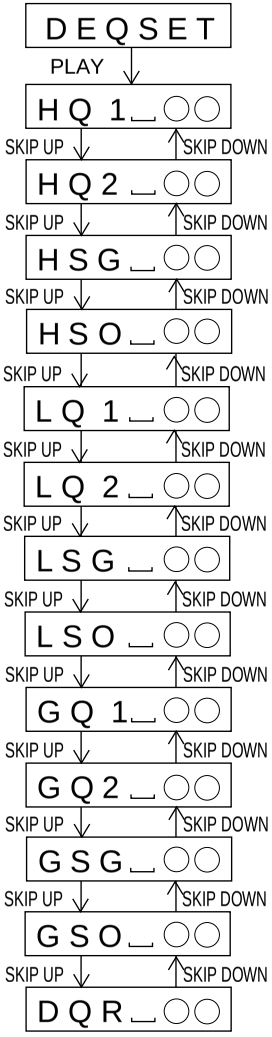
: Focus balance factor
○○: setting

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In specific state pressing the [DISP] key causes change to "focus setting menu".
* In the specific setting display state the setting change digit changes when the [P-MODE] key is pressed.



* In the specific state the setting changes in the range of "0h to Fh" when the [VOL UP/DOWN" key is pressed.

Digital EQ Setting



: Digital EQ setting menu

: High-reflection pit section Digital EQ tap factor A, D
○○: setting

: High-reflection pit section Digital EQ tap factor B, C
○○: setting

: High-reflection pit section Autolevel slicer gain
○○: setting

: High-reflection pit section Autolevel slicer slice level offset
○○: setting

: Lows-reflection pit section Digital EQ tap factor A, D
○○: setting

: Lows-reflection pit section Digital EQ tap factor B, C
○○: setting

: Low-reflection pit section Autolevel slicer gain
○○: setting

: Low-reflection pit section Autolevel slicer slice level offset
○○: setting

: Low-reflection groove section digital EQ tap factor A, D
○○: setting

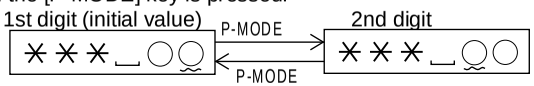
: Low-reflection groove section digital EQ tap factor B, C
○○: setting

: Low-reflection groove section Autolevel slicer gain
○○: setting

: Low-reflection groove section Autolevel slicer slice level offset
○○: setting

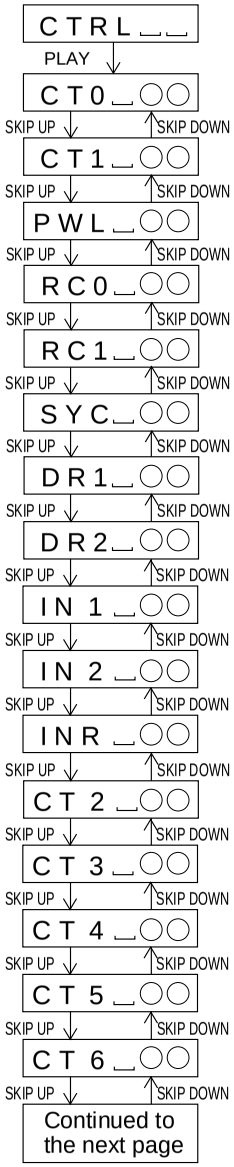
: Digital EQ-related other settings
○○: setting

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In specific state pressing the [DISP] key causes change to "focus setting menu".
* In the specific setting display state the setting change digit changes when the [P-MODE] key is pressed.



* In the specific state the setting changes in the range of "0h to Fh" when the [VOL UP/DOWN" key is pressed.

Control Setting (record/playback machine)



: Control setting menu

: Play start SD number, EEPROM version
○○: setting

: REC superposition, EL existence/nonexistence, move start minimum number, high-speed jump over-run
○○: setting

: DC-IN existence/nonexistence judgment level, AC adapter judgment level, built-in battery full judgment level
○○: setting

: Recording bit distribution parameter 0
○○: setting

: Recording bit distribution parameter 1
○○: setting

: Syncro level selection
○○: setting

: Dry cell exhaustion detection level setting 1
○○: setting

: Dry cell exhaustion detection level setting 2
○○: setting

: Built-in battery exhaustion detection level setting 1
○○: setting

: Built-in battery exhaustion detection level setting 2
○○: setting

: Intermittent servo restart accumulation sector number setting
○○: setting

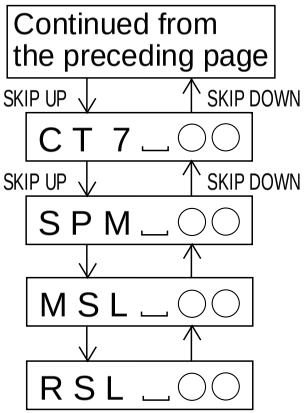
: Control setting 2
○○: setting

: Control setting 3
○○: setting

: Control setting 4
○○: setting

: Control setting 5
○○: setting

: Control setting 6
○○: setting



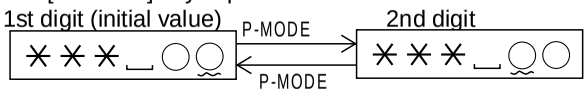
: Control setting 2
○○: setting

: Special mode selection data (unprotect area)
○○: setting

: Monitor selection data (unprotect area)
○○: setting

: Control-related other setting data (unprotect area)
○○: setting

* When the "STOP" button is pressed in specific menu, the TEST MODE STOP state is set.
* In specific state pressing the [DISP] key causes change to "focus setting menu".
* In the specific setting display state the setting change digit changes when the [P-MODE] key is pressed.



* In the specific state the setting changes in the range of "0h to Fh" when the [VOL UP/DOWN" key is pressed.

NOTES ON SCHEMATIC DIAGRAM

• Resistor:
To differentiate the units of resistors, such symbol as K and M are used: the symbol K means 1000 ohm and the symbol M means 1000 kohm and the resistor without any symbol is ohm-type resistor. Besides, the one with “Fusible” is a fuse type.

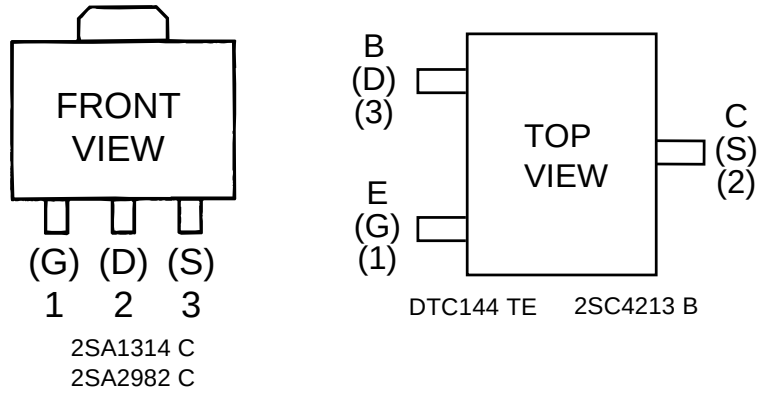
• Capacitor:
To indicate the unit of capacitor, a symbol P is used: this symbol P means micro-micro-farad and the unit of the capacitor without such a symbol is microfarad. As to electrolytic capacitor, the expression “capacitance/withstand voltage” is used.

REF. NO	DESCRIPTION	POSITION
SW401	EJECT	OFF—ON
SW402	HOLD	OFF—ON
SW901	DISC IN	OFF—ON
SW902	DISC PROTECT	OFF—ON

(CH), (TH), (RH), (UJ): Temperature compensation
(ML): Mylar type

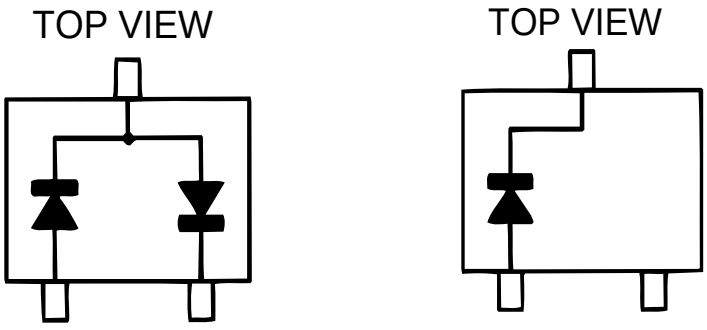
• The indicated voltage in each section is the one measured by Digital Multimeter between such a section and the chassis with no signal given.

• Parts marked with “ ⚠ ” (⊏ ═ ═ ═ ⊐) are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.



2SA1314 C
2SA2982 C

DTC144 TE 2SC4213 B



SB0209CP
DA221
1SS373

SB00703Q

Figure 28 TYPES OF TRANSISTORS AND DIODES

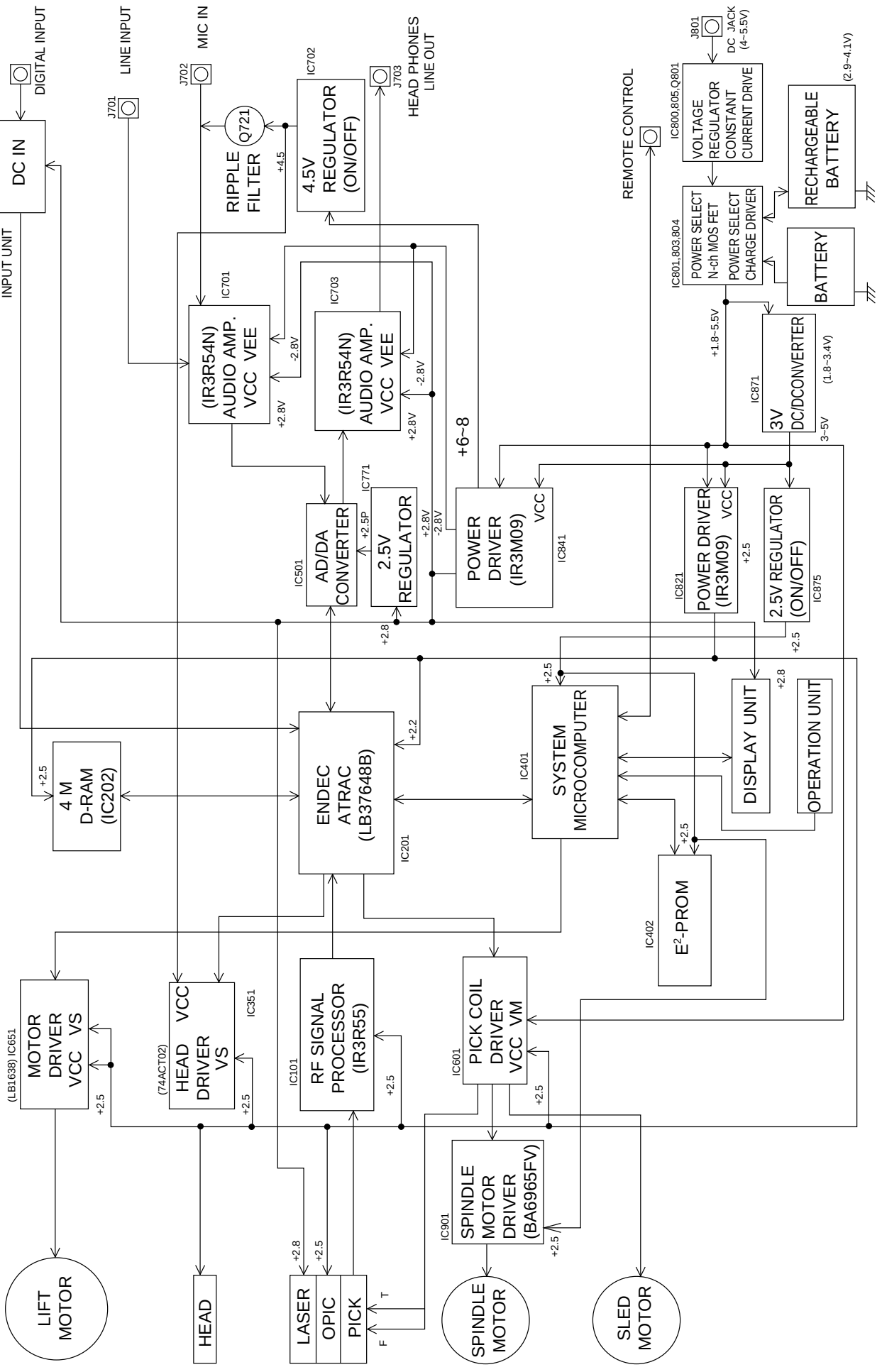


Figure 29 BLOCK DIAGRAM

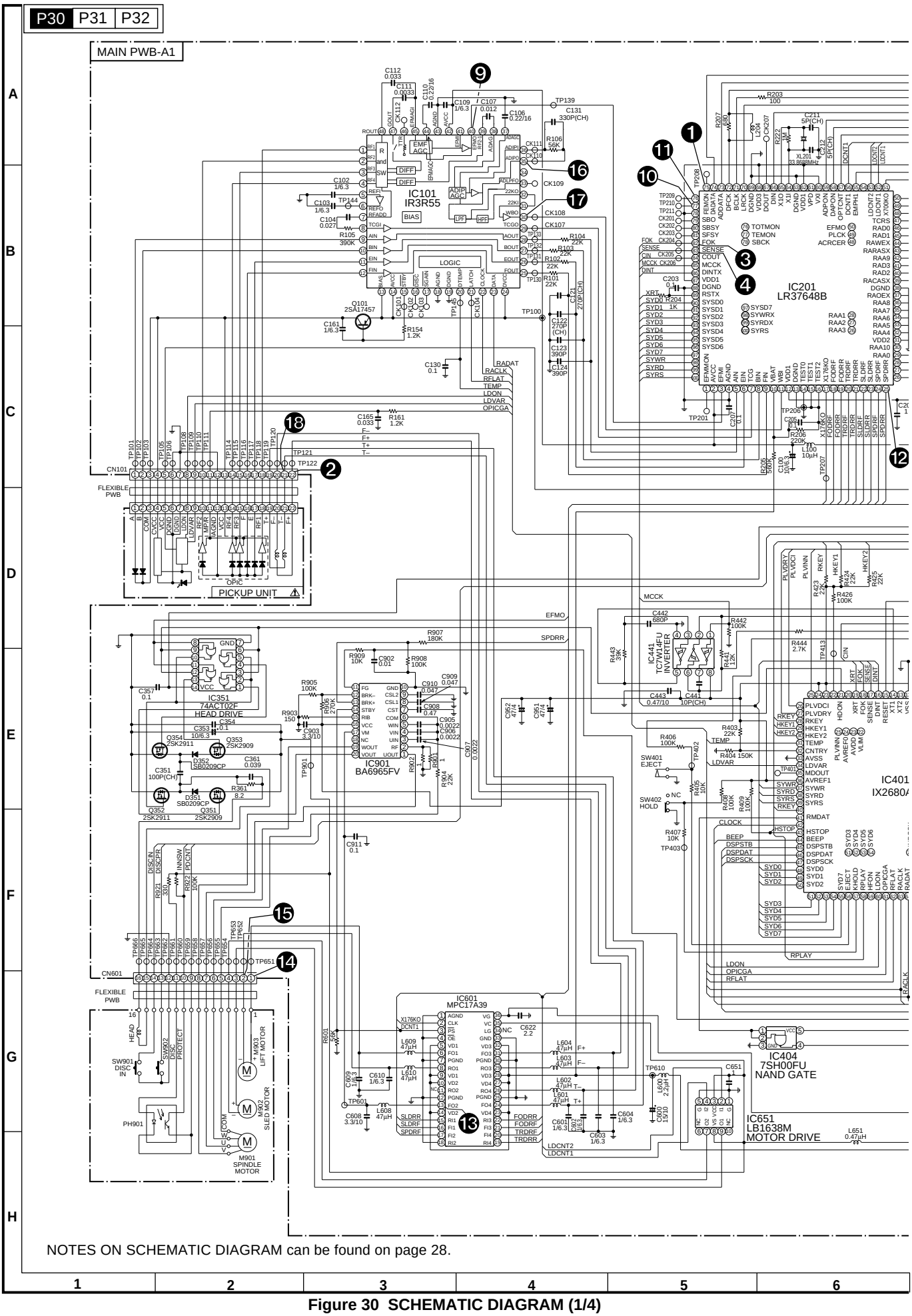
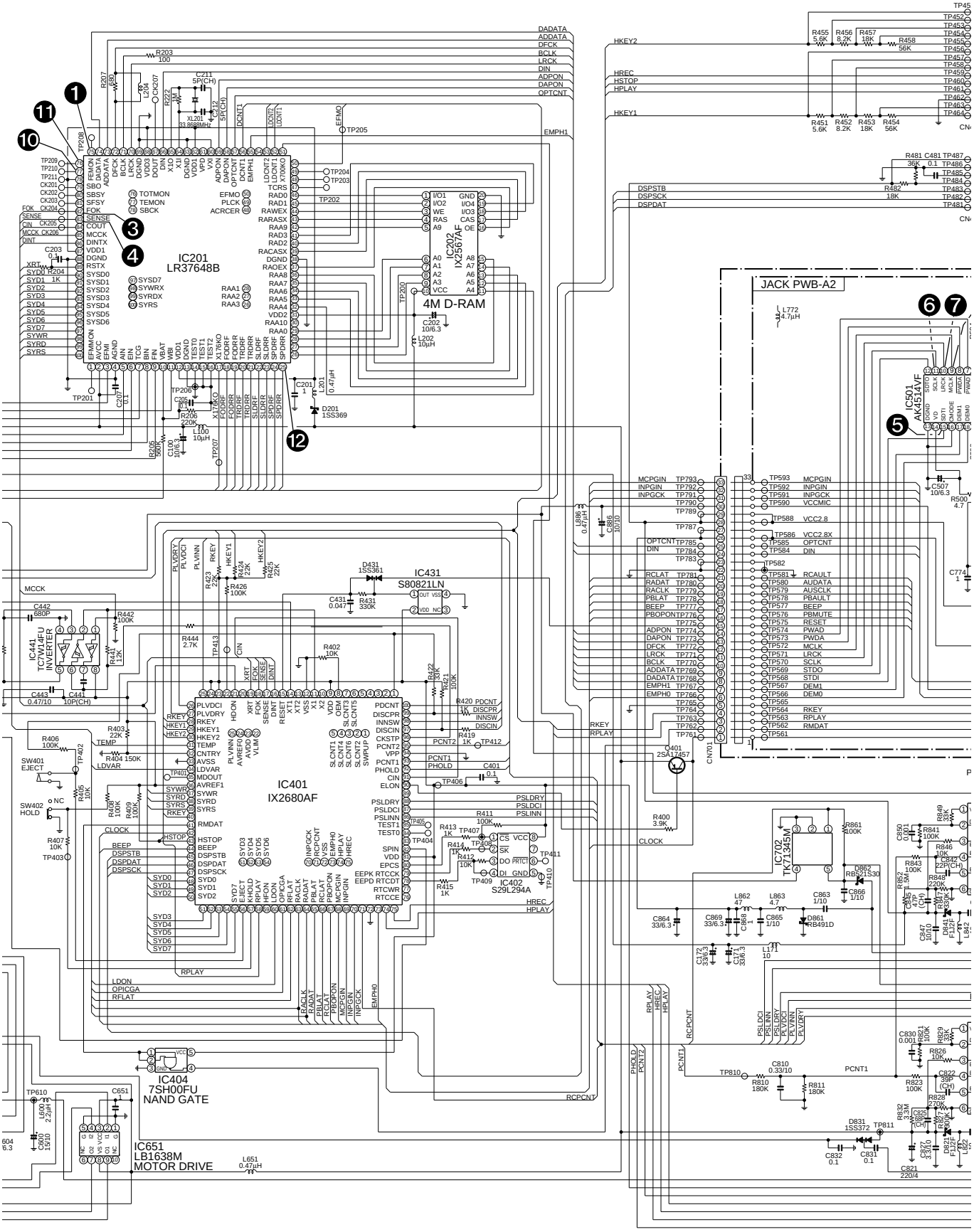


Figure 30 SCHEMATIC DIAGRAM (1/4)

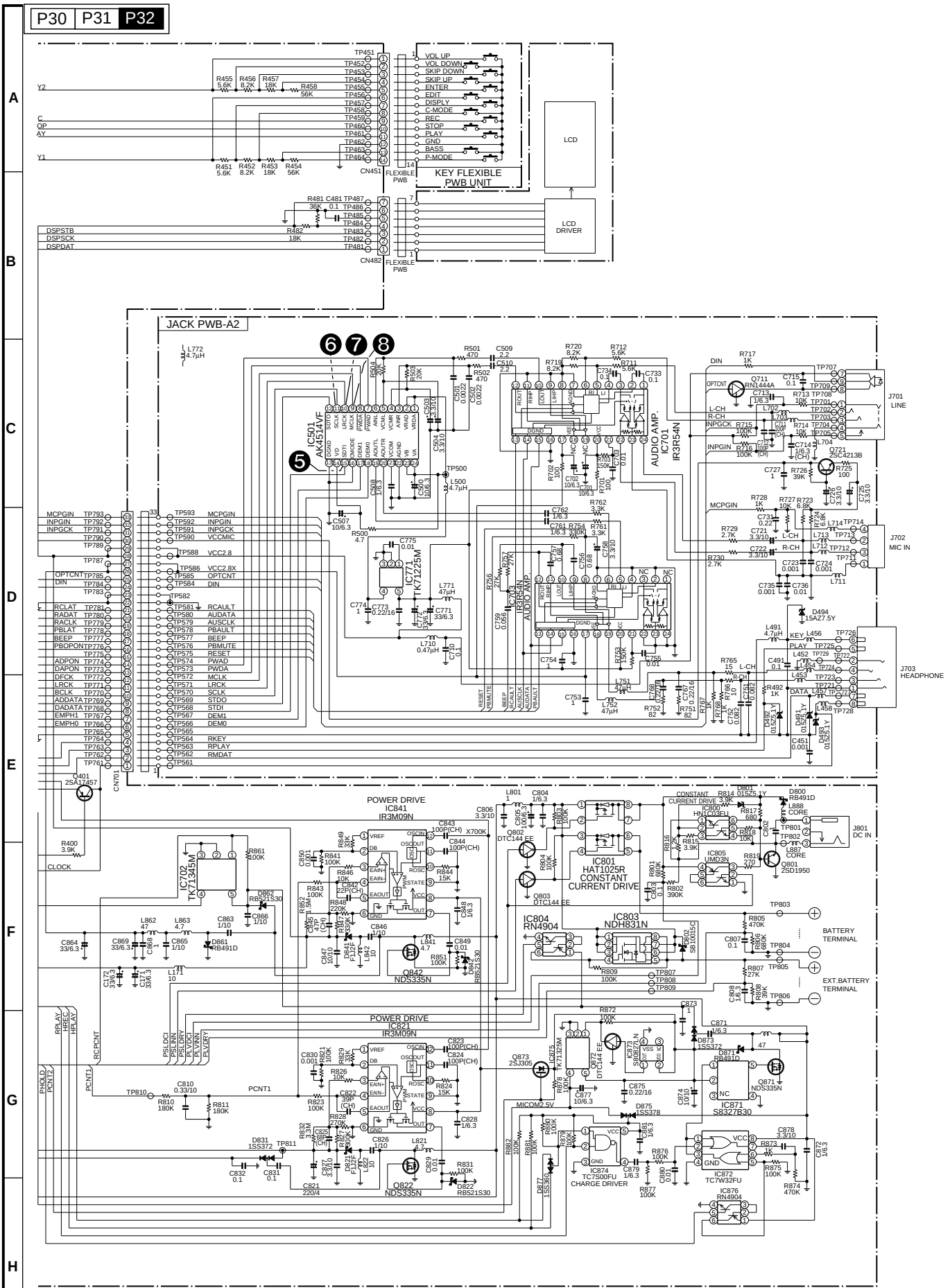
P30 P31 P32



The numbers ❶ to ⑱ are waveform numbers shown in page 39.

7	8	9	10	11	12

Figure 31 SCHEMATIC DIAGRAM (2/4)



NOTES ON SCHEMATIC DIAGRAM can be found on page 28.

Figure 32 SCHEMATIC DIAGRAM (3/4)

IC101

PIN NO.	VOLTAGE
1	0.7V
2	0.7V
3	0.7V
4	0.7V
5	1.29V
6	1.26V
7	0.7V
8	1.26V
9	1.26V
10	1.26V
11	1.26V
12	1.26V
13	2.52V
14	2.52V
15	0.18V
16	2.52V
17	2.52V
18	0V
19	0V
20	1.46V
21	2.52V
22	0V
23	0V
24	2.51V
25	1.26V
26	1.26V
27	1.26V
28	1.26V
29	1.26V
30	1.8V
31	1.26V
32	1.26V
33	1.26V
34	0V
35	1.26V
36	1.26V
37	0V
38	1.26V
39	1.26V
40	1.26V
41	1.26V
42	2.52V
43	0V
44	0V
45	1.0V
46	1.0V
47	1.0V
48	1.0V

IC201

PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
1	1.0V	51	0V
2	2.5V	52	0V
3	1.27V	53	0V
4	0V	54	0V
5	1.27V	55	0V
6	1.27V	56	2.15V
7	1.27V	57	0V
8	1.27V	58	0V
9	1.26V	59	0V
10	2.2V	60	0V
11	1.43V	61	0.8V
12	2.15V	62	2.15V
13	0V	63	0V
14	0V	64	1.0V
15	0V	65	1.0V
16	0V	66	2.3V
17	1.0V	67	2.15V
18	0V	68	2.15V
19	0V	69	0V
20	0V	70	1.0V
21	0V	71	1.0V
22	0V	72	0V
23	0V	73	0V
24	0V	74	0V
25	0V	75	0V
26	0.6V	76	0V
27	0.6V	77	0V
28	0.6V	78	2.15V
29	1.4V	79	0V
30	0.9V	80	2.15V
31	2.5V	81	1.0V
32	2.5V	82	2.15V
33	0.8V	83	0V
34	0.9V	84	0V
35	0.9V	85	1.0V
36	1.0V	86	2.15V
37	1.8V	87	2.15V
38	0V	88	0V
39	2.0V	89	2.5V
40	1.3V	90	0.5V
41	1.5V	91	0.6V
42	1.1V	92	0.5V
43	1.7V	93	1.0V
44	2.5V	94	1.2V
45	1.6V	95	0.9V
46	1.6V	96	1.2V
47	0V	97	0.4V
48	2.0V	98	2.45V
49	1.0V	99	2.5V
50	0.9V	100	0V

IC202

PIN NO.	VOLTAGE
1	1.5V
2	1.7V
3	2.5V
4	1.9V
5	0.9V
6	1.4V
7	0.6V
8	0.6V
9	0.6V
10	2.53V
11	0.6V
12	1.0V
13	1.0V
14	1.0V
15	1.0V
16	1.8V
17	2.0V
18	1.6V
19	1.7V
20	0V

IC351

PIN NO.	VOLTAGE
1	0V
2	0V
3	2.5V
4	0V
5	0V
6	2.5V
7	0V
8	1.0V
9	2.5V
10	0V
11	1.0V
12	2.5V
13	0V
14	4.5V

IC401

PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
1	2.5V	51	0.95V
2	0V	52	1.1V
3	0V	53	0.95V
4	0V	54	1.1V
5	0V	55	0.8V
6	0V	56	0V
7	0V	57	2.47V
8	2.5V	58	2.96V
9	2.5V	59	0V
10	1.18V	60	0V
11	0V	61	0V
12	0V	62	2.5V
13	1.18V	63	0V
14	1.18V	64	0V
15	2.42V	65	2.5V
16	2.1V	66	0V
17	0V	67	2.5V
18	2.1V	68	2.35V
19	2.5V	69	2.75V
20	0V	70	2.75V
21	2.5V	71	0V
22	0V	72	0V
23	0V	73	0V
24	0V	74	3.12V
25	2.9V	75	3.12V
26	1.8V	76	0V
27	0V	77	0V
28	2.5V	78	0.4V
29	2.5V	79	0V
30	2.5V	80	2.5V
31	1.48V	81	2.5V
32	2.5V	82	2.5V
33	0V	83	0V
34	0V	84	2.5V
35	0V	85	2.5V
36	2.5V	86	2.5V
37	2.46V	87	2.5V
38	2.5V	88	0V
39	0V	89	0V
40	2.5V	90	2.0V
41	0.27V	91	0V
42	1.5V	92	2.5V
43	2.47V	93	2.5V
44	2.5V	94	0V
45	2.2V	95	0V
46	2.43V	96	1.2V
47	0.7V	97	0V
48	0.8V	98	0.45V
49	0.8V	99	2.5V
50	0.8V	100	0.3V

IC402

PIN NO.	VOLTAGE
1	2.5V
2	0V
3	1.2V
4	1.2V
5	0V
6	2.5V
7	0V
8	2.5V

IC404

PIN NO.	VOLTAGE
1	0.25V
2	0.25V
3	0V
4	2.23V
5	2.5V

IC441

PIN NO.	VOLTAGE
1	1.0V
2	1.2V
3	1.1V
4	0V
5	1.1V
6	1.2V
7	1.3V
8	2.5V

IC501

PIN NO.	VOLTAGE
1	2.5V
2	2.5V
3	0V
4	0V
5	0V
6	0V
7	1.0V
8	1.0V
9	1.0V
10	1.0V
11	1.0V
12	0V
13	0V
14	2.5V
15	0V
16	0V
17	0.95V
18	0V
19	0.35V
20	.035V
21	0V
22	0V
23	2.5V
24	2.5V

IC431

PIN NO.	VOLTAGE
1	2.5V
2	2.5V
3	0V
4	0V

IC601

PIN NO.	VOLTAGE
1	0V
2	1.0V
3	2.1V
4	0V
5	5.0V
6	0V
7	0V
8	0V
9	5.0V
10	5.0V
11	0V
12	0V
13	0V
14	5.0V
15	0V
16	0V
17	0V
18	0V
19	0V
20	0V
21	0V
22	0V
23	5.0V
24	0V
25	0V
26	0V
27	5.0V
28	5.0V
29	0V
30	0V
31	0V
32	5.0V
33	0V
34	0V
35	2.5V
36	10.8V

IC651

PIN NO.	VOLTAGE
1	0V
2	0V
3	2.5V
4	0V
5	0V
6	0V
7	1.2V
8	2.5V
9	1.2V
10	0V

KIC1

PIN NO.	VOLTAGE
1	5.14V
2	5.14V
3	5.09V
4	0V
5	5.09V
6	5.15V
7	5.16V
8	10.33V

KIC2

PIN NO.	VOLTAGE
1	5.16V
2	5.16V
3	5.16V
4	0V
5	5.16V
6	5.16V
7	5.16V
8	10.34V

IC703

PIN NO.	VOLTAGE
1	1.3V
2	0V
3	0V
4	0V
5	0V
6	0V
7	0V
8	0.95V
9	0V
10	1.9V
11	0V
12	1.95V
13	2.5V
14	0V
15	0V
16	0V
17	–2.85V
18	0V
19	0V
20	2.78V
21	0.83V
22	0V
23	0V
24	0V

IC702

PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	4.5V
5	7.7V

IC701

PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	0V
6	0V
7	0V
8	0V
9	0V
10	0V
11	0V
12	0V
13	0V
14	0V
15	0V
16	0V
17	–2.85V
18	0V
19	0V
20	2.75V
21	0.8V
22	0V
23	0V
24	0V

IC771

PIN NO.	VOLTAGE
1	1.4V
2	0V
3	0V
4	2.5V
5	2.8V

IC801

PIN NO.	VOLTAGE
1	5.0V
2	0V
3	5.0V
4	0V
5	5.0V
6	5.0V
7	5.0V
8	5.0V

IC803

PIN NO.	VOLTAGE
1	5.0V
2	5.0V
3	5.0V
4	0V
5	0V
6	5.0V
7	5.0V
8	0V

IC804

PIN NO.	VOLTAGE
1	7.7V
2	7.6V
3	7.6V
4	0V
5	0V
6	0V

IC821

PIN NO.	VOLTAGE
1	1.25V
2	0.9V
3	1.25V
4	1.23V
5	1.1V
6	0V
7	0.8V
8	4.8V
9	0V
10	0.4V
11	1.0V
12	1.0V

IC841

PIN NO.	VOLTAGE
1	1.25V
2	0.9V
3	1.33V
4	1.22V
5	1.22V
6	0V
7	0V
8	4.8V
9	0V
10	0.4V
11	1.0V
12	1.0V

IC872

PIN NO.	VOLTAGE
1	5.0V
2	0V
3	5.0V
4	0V
5	5.0V
6	5.0V
7	5. 0V
8	5.0V

IC871

PIN NO.	VOLTAGE
1	5.0V
2	4.8V
3	0V
4	0V
5	0V

IC875

PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	2.5V
5	4.8V

IC873

PIN NO.	VOLTAGE
1	4.8V
2	4.8V
3	0V
4	0V

IC874

PIN NO.	VOLTAGE
1	3.5V
2	2.97V
3	0V
4	0V
5	4.9V

IC876

PIN NO.	VOLTAGE
1	5.0V
2	0V
3	0V
4	0V
5	2.5V
6	5.0V

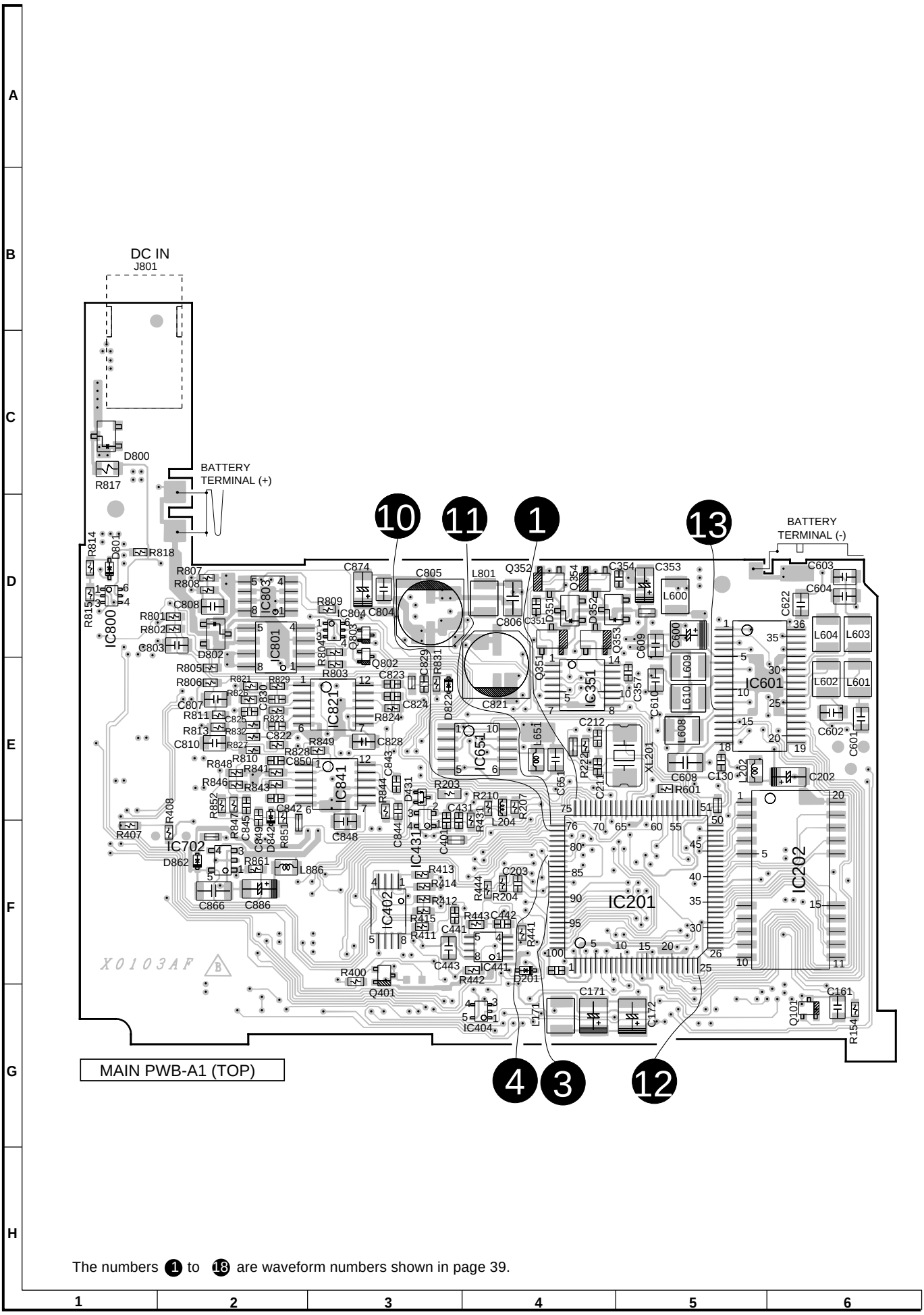
IC901

PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	0V
6	0V
7	2.4V
8	2.45V
9	1.87V
10	0V
11	2.5V
12	2.1V
13	0V
14	2.1V
15	0V
16	2.5V
17	2.5V
18	0V
19	0V
20	0V

The numbers ❶ to ⓲ are waveform numbers shown in page 39.

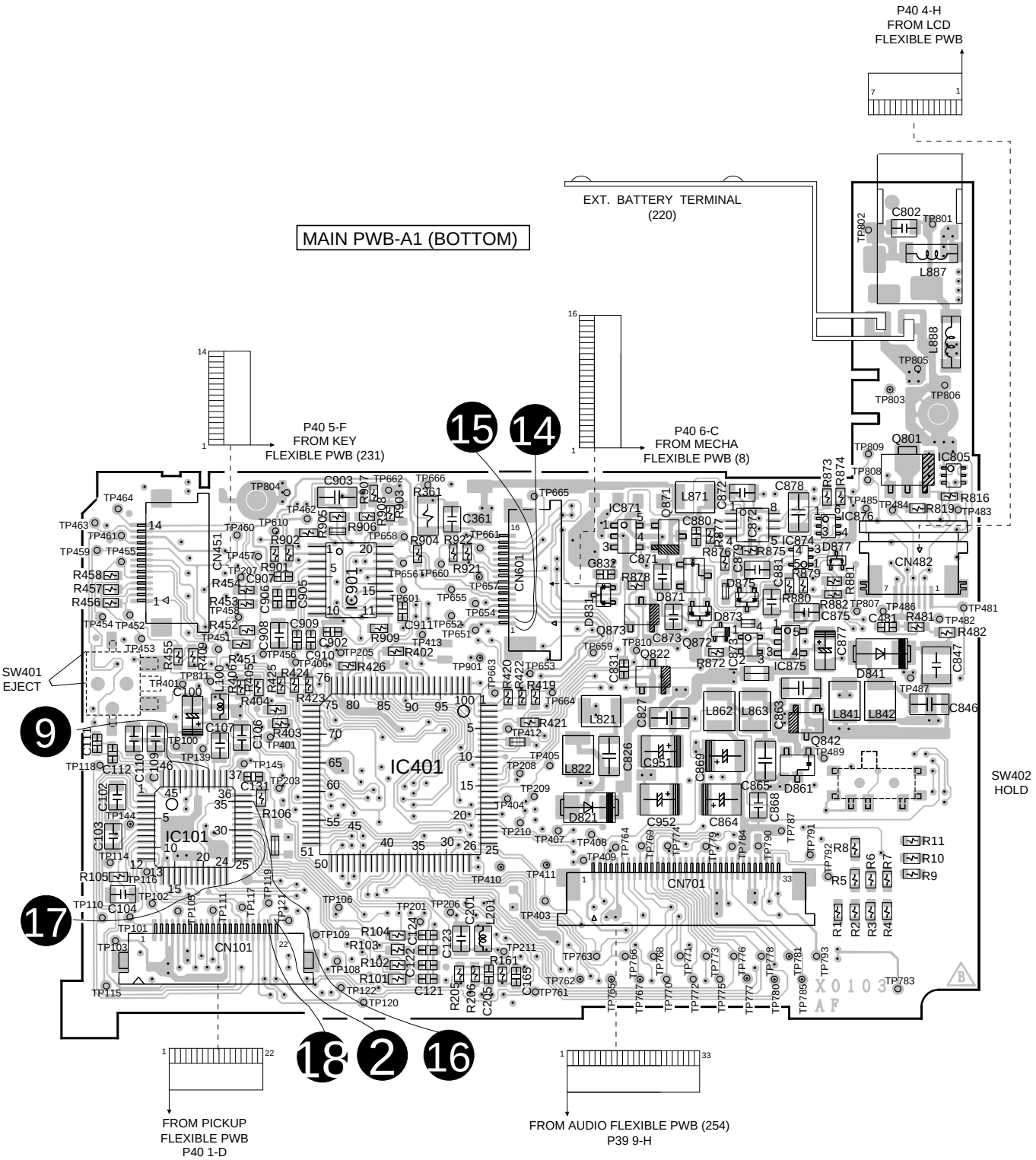
7	8	9	10	11	12

Figure 33 SCHEMATIC DIAGRAM (4/4)



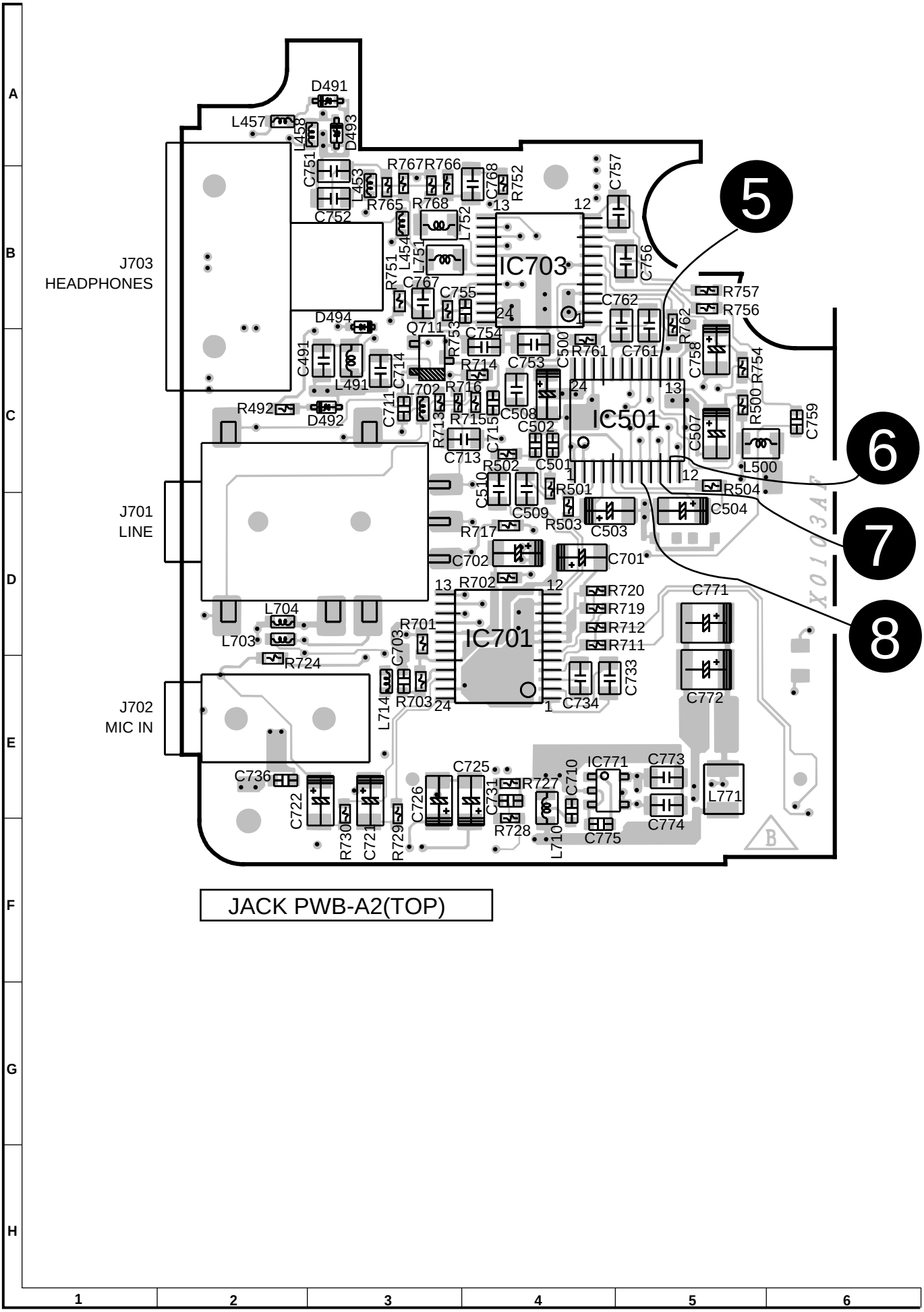
The numbers ❶ to ⑱ are waveform numbers shown in page 39.

Figure 34 WIRING OF P.W.BOARD (1/5)



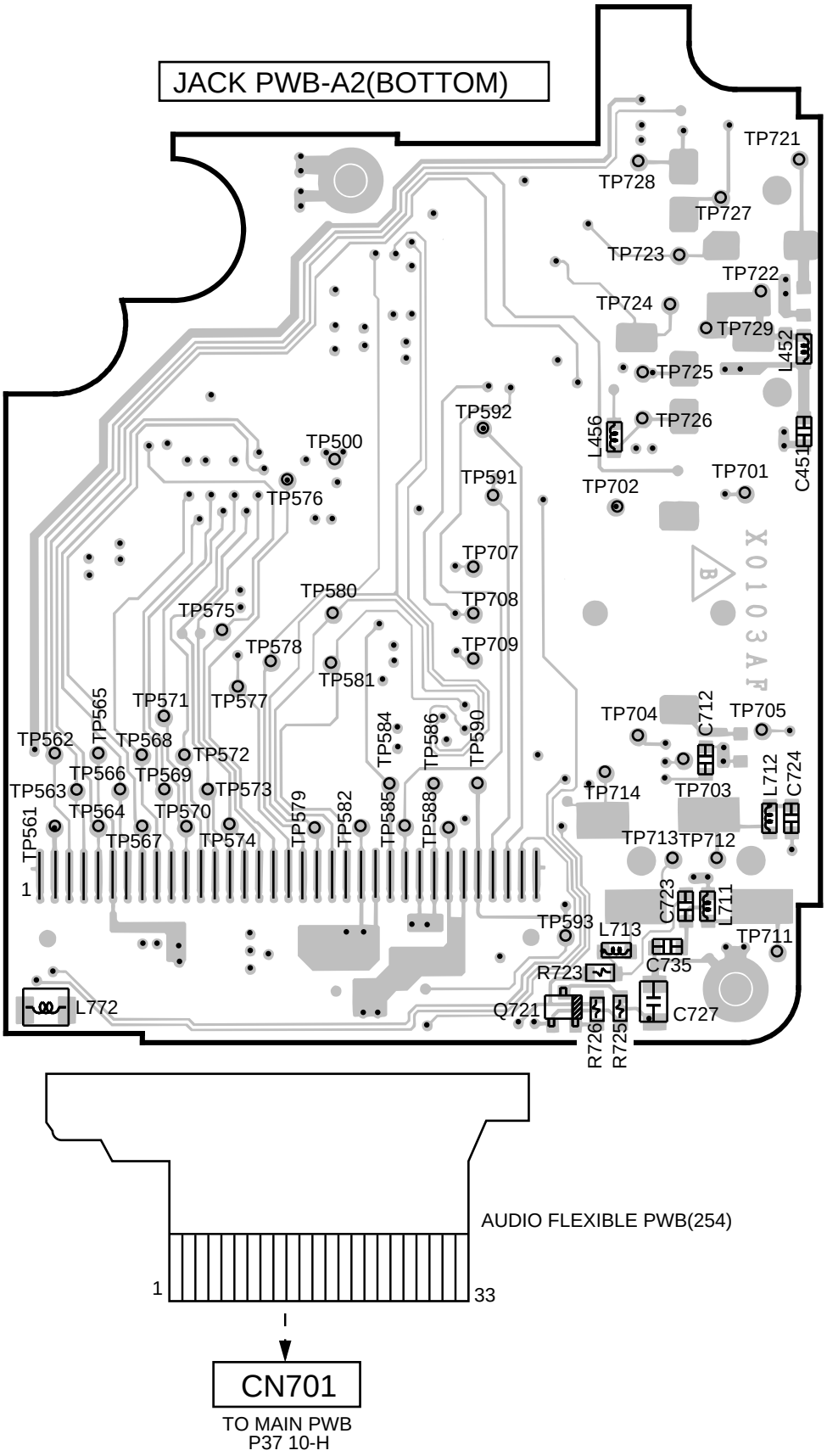
7	8	9	10	11	12

Figure 35 WIRING OF P.W.BOARD (2/5)



JACK PWB-A2(TOP)

Figure 36 WIRING OF P.W.BOARD (3/5)



7	8	9	10	11	12

Figure 37 WIRING OF P.W.BOARD (4/5)

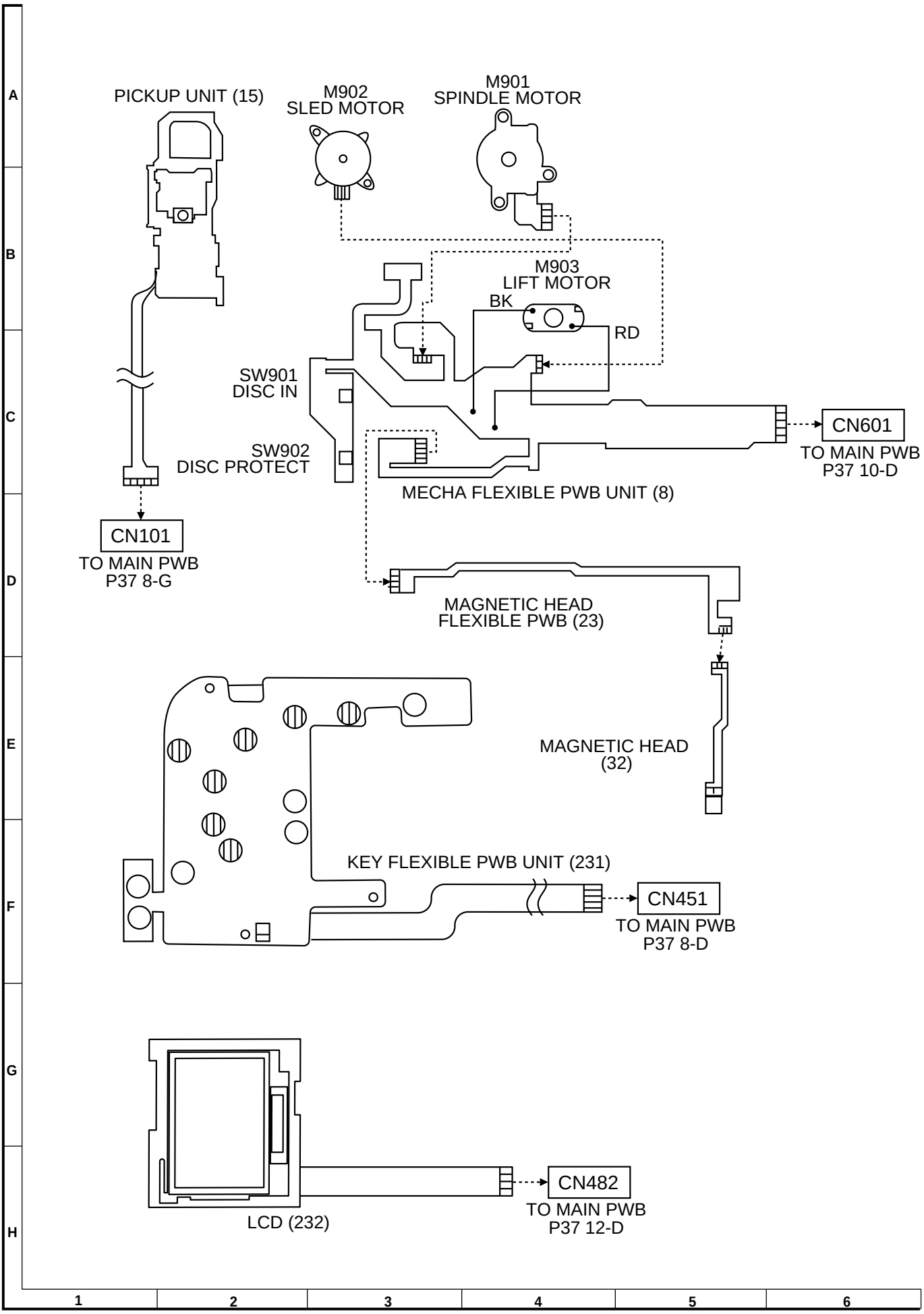
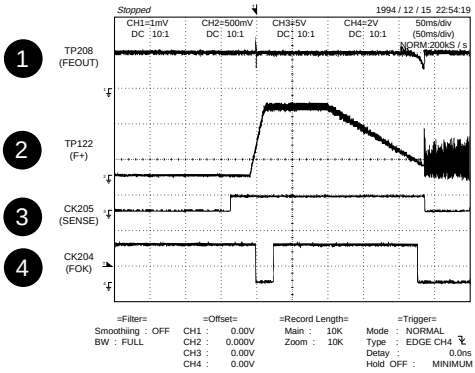
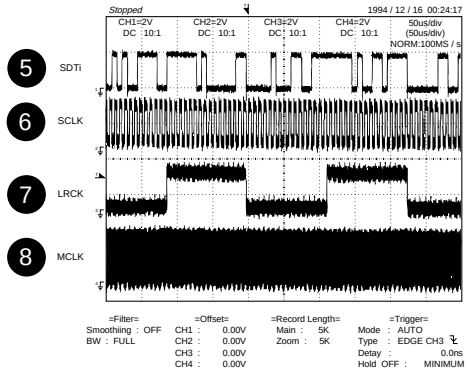
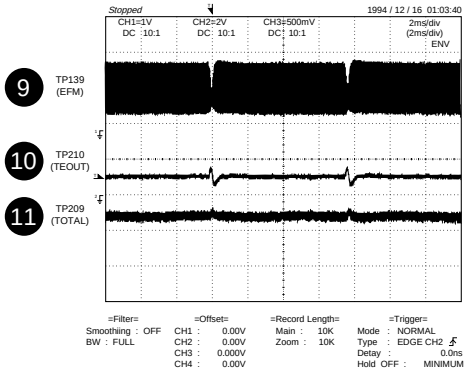


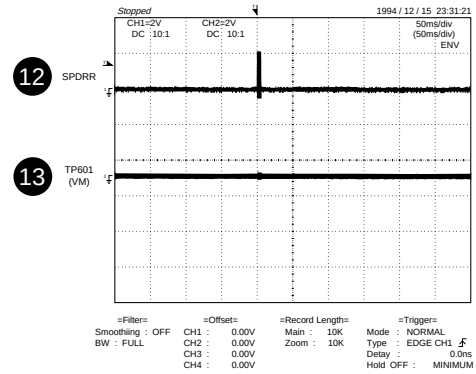
Figure 38 WIRING OF P.W.BOARD (5/5)

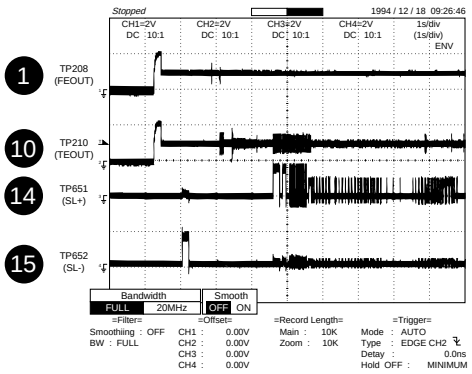
WAVEFORMS OF MD CIRCUIT

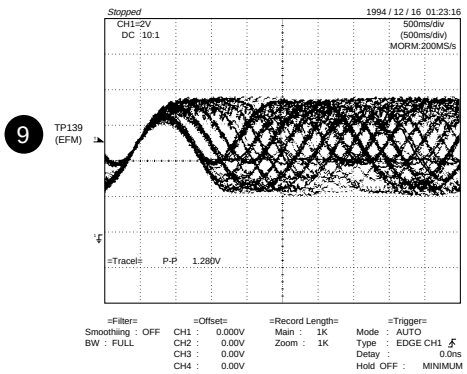

Stopped
1994 / 12 / 15 22:54:19
CH1=1mV DC :10:1
CH2=500mV DC: 10:1
CH3=5V DC: 10:1
CH4=2V DC: 10:1
50ms/div (50ms/div)
NORM:200kS / s
1 TP208 (FEOUT)
2 TP122 (F+)
3 CK205 (SENSE)
4 CK204 (FOK)
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.000V CH3 : 0.00V CH4 : 0.00V
=Record Length= Main : 10K Zoom : 10K
=Trigger= Mode : NORMAL Type : EDGE CH4 Detay : 0.0ns Hold OFF : MINIMUM

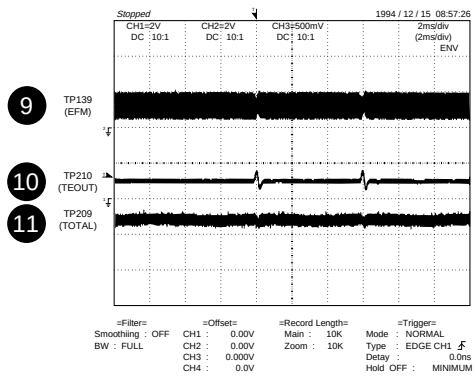

Stopped
1994 / 12 / 16 00:24:17
CH1=2V DC :10:1
CH2=2V DC: 10:1
CH3=2V DC: 10:1
CH4=2V DC: 10:1
50us/div (50us/div)
NORM:100MS / s
5 SDTi
6 SCLK
7 LRCK
8 MCLK
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : 0.00V CH4 : 0.00V
=Record Length= Main : 5K Zoom : 5K
=Trigger= Mode : AUTO Type : EDGE CH3 Detay : 0.0ns Hold OFF : MINIMUM

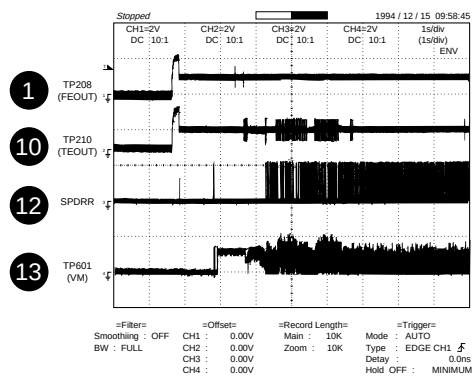

Stopped
1994 / 12 / 16 01:03:40
CH1=1V DC :10:1
CH2=2V DC: 10:1
CH3=500mV DC: 10:1
2ms/div (2ms/div)
ENV
9 TP139 (EFM)
10 TP210 (TEOUT)
11 TP209 (TOTAL)
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : 0.000V CH4 : 0.00V
=Record Length= Main : 10K Zoom : 10K
=Trigger= Mode : NORMAL Type : EDGE CH2 Detay : 0.0ns Hold OFF : MINIMUM

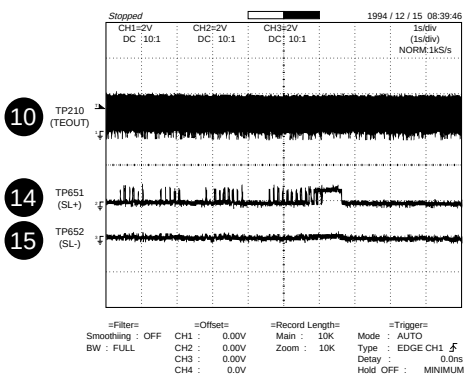

Stopped
1994 / 12 / 15 23:31:21
CH1=2V DC :10:1
CH2=2V DC: 10:1
50ms/div (50ms/div)
ENV
12 SPDRR
13 TP601 (VM)
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : 0.00V CH4 : 0.00V
=Record Length= Main : 10K Zoom : 10K
=Trigger= Mode : NORMAL Type : EDGE CH1 Detay : 0.0ns Hold OFF : MINIMUM

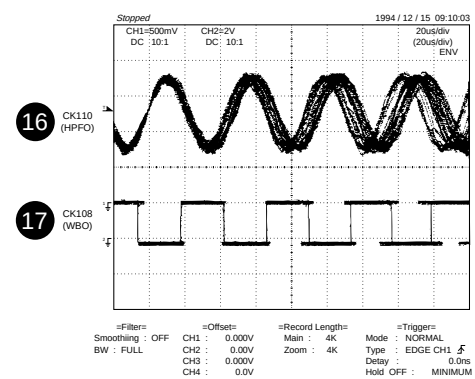

Stopped
1994 / 12 / 18 09:26:46
CH1=2V DC :10:1
CH2=2V DC: 10:1
CH3=2V DC: 10:1
CH4=2V DC: 10:1
1s/div (1s/div)
ENV
1 TP208 (FEOUT)
10 TP210 (TEOUT)
14 TP651 (SL+)
15 TP652 (SL-)
Bandwidth FULL 20MHz
Smooth OFF ON
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : 0.00V CH4 : 0.00V
=Record Length= Main : 10K Zoom : 10K
=Trigger= Mode : AUTO Type : EDGE CH2 Detay : 0.0ns Hold OFF : MINIMUM

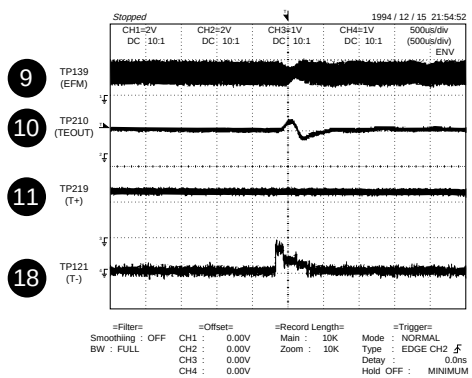

Stopped
1994 / 12 / 16 01:23:16
CH1=2V DC :10:1
500ms/div (500ms/div)
NORM:200MS/s
9 TP139 (EFM)
=Tracel= P-P 1.280V
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.000V CH2 : 0.00V CH3 : 0.00V CH4 : 0.00V
=Record Length= Main : 1K Zoom : 1K
=Trigger= Mode : AUTO Type : EDGE CH1 Detay : 0.0ns Hold OFF : MINIMUM


Stopped
1994 / 12 / 15 08:57:26
CH1=2V DC :10:1
CH2=2V DC: 10:1
CH3=500mV DC: 10:1
2ms/div (2ms/div)
ENV
9 TP139 (EFM)
10 TP210 (TEOUT)
11 TP209 (TOTAL)
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : 0.000V CH4 : 0.0V
=Record Length= Main : 10K Zoom : 10K
=Trigger= Mode : NORMAL Type : EDGE CH1 Detay : 0.0ns Hold OFF : MINIMUM


Stopped
1994 / 12 / 15 09:58:45
CH1=2V DC :10:1
CH2=2V DC: 10:1
CH3=2V DC: 10:1
CH4=2V DC: 10:1
1s/div (1s/div)
ENV
1 TP208 (FEOUT)
10 TP210 (TEOUT)
12 SPDRR
13 TP601 (VM)
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : 0.00V CH4 : 0.00V
=Record Length= Main : 10K Zoom : 10K
=Trigger= Mode : AUTO Type : EDGE CH1 Detay : 0.0ns Hold OFF : MINIMUM


Stopped
1994 / 12 / 15 08:39:46
CH1=2V DC :10:1
CH2=2V DC: 10:1
CH3=2V DC: 10:1
1s/div (1s/div)
NORM:1kS/s
10 TP210 (TEOUT)
14 TP651 (SL+)
15 TP652 (SL-)
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : 0.00V CH4 : 0.0V
=Record Length= Main : 10K Zoom : 10K
=Trigger= Mode : AUTO Type : EDGE CH1 Detay : 0.0ns Hold OFF : MINIMUM


Stopped
1994 / 12 / 15 09:10:03
CH1=500mV DC :10:1
CH2=2V DC: 10:1
20us/div (20us/div)
ENV
16 CK110 (HPFO)
17 CK108 (WBO)
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.000V CH2 : 0.00V CH3 : 0.000V CH4 : 0.0V
=Record Length= Main : 4K Zoom : 4K
=Trigger= Mode : NORMAL Type : EDGE CH1 Detay : 0.0ns Hold OFF : MINIMUM


Stopped
1994 / 12 / 15 21:54:52
CH1=2V DC :10:1
CH2=2V DC: 10:1
CH3=1V DC: 10:1
CH4=1V DC: 10:1
500us/div (500us/div)
ENV
9 TP139 (EFM)
10 TP210 (TEOUT)
11 TP219 (T+)
18 TP121 (T-)
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : 0.00V CH4 : 0.00V
=Record Length= Main : 10K Zoom : 10K
=Trigger= Mode : NORMAL Type : EDGE CH2 Detay : 0.0ns Hold OFF : MINIMUM

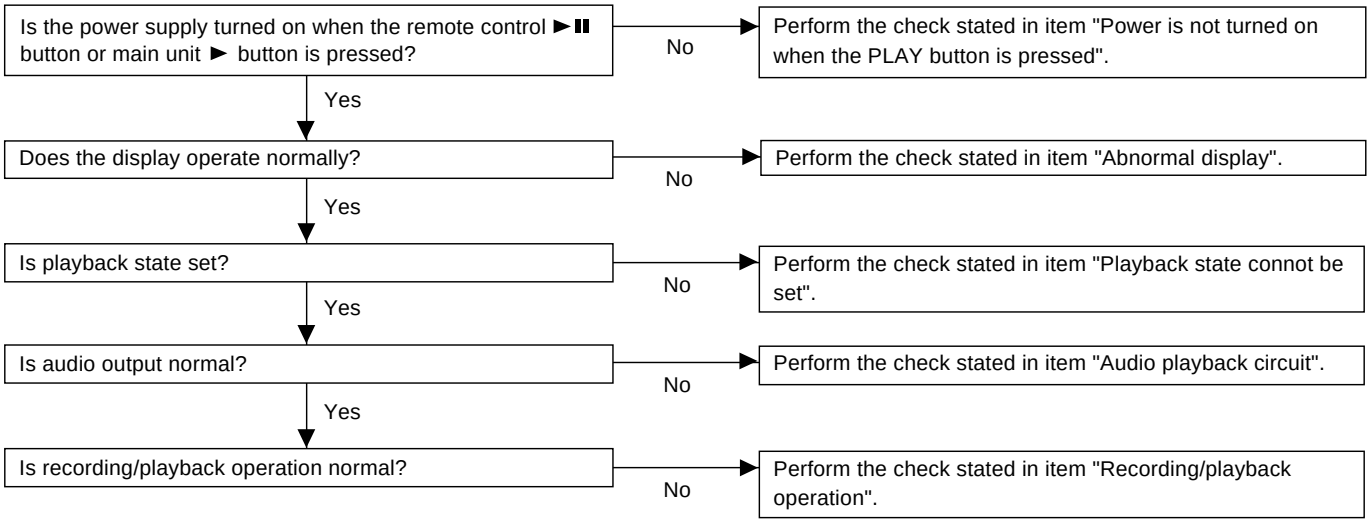
TROUBLESHOOTING

It is advisable to use the TEST mode (refer to Error Data Display Mode, P15) indicating the causes of troubles before starting repair. Causes of operation errors (up to 10 errors) are recorded as error codes. This information is useful for repair.

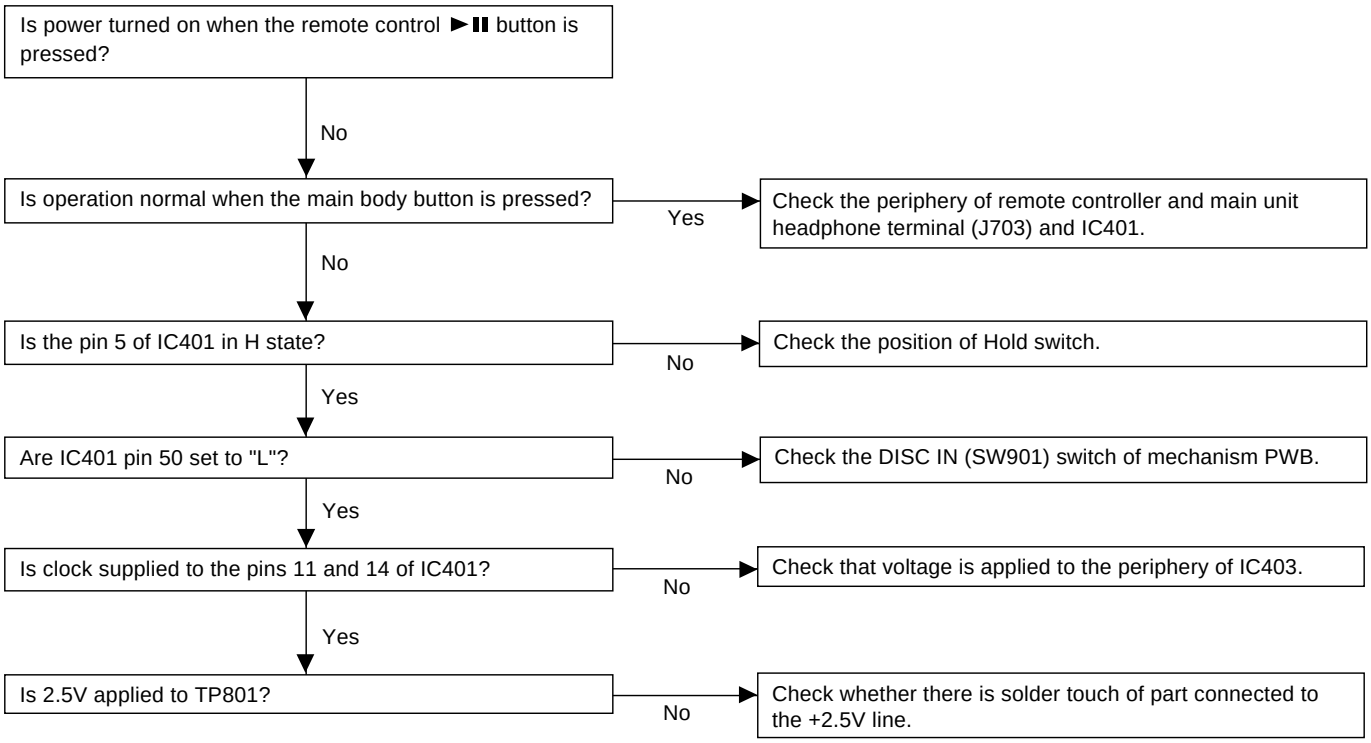
When does not function

When the CD section does not operate When the objective lens of the optical pickup is dirty,this section may not operate.Clean the objective lens,and check the playback operation.When this section does not operate even after the above step is taken,check the following items.
Remove the cabinet and follow the troubleshooting instructions.
"Track skipping and/or no TOC(Table Of Contents) may be caused by build up of dust other foreign matter on the laser pickup lens. Before attempting any adjustment make certain that the lens is clean. If not, clean it as mentioned below."

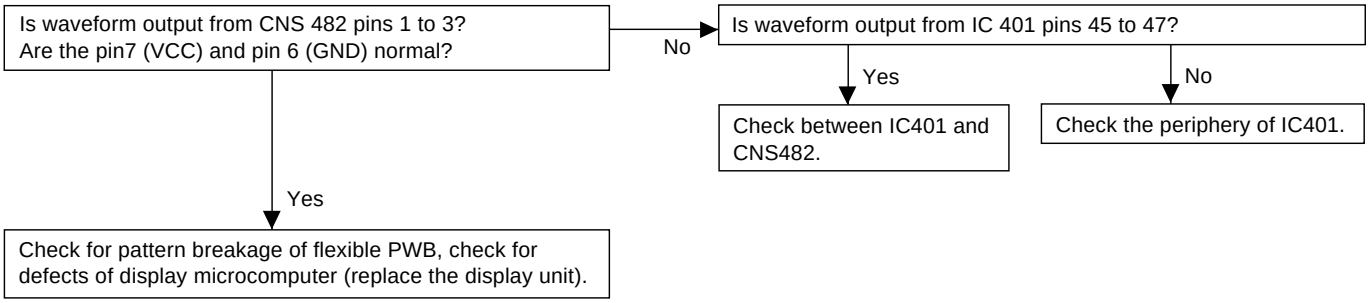
Turn the power off.
Gently clean the lens with a lens cleaning tissue and a small amount of isopropyl alcohol.
Do not touch the lens with the bare hand.


Is the power supply turned on when the remote control ►II button or main unit ► button is pressed?
No
Perform the check stated in item "Power is not turned on when the PLAY button is pressed".
Yes
Does the display operate normally?
No
Perform the check stated in item "Abnormal display".
Yes
Is playback state set?
No
Perform the check stated in item "Playback state connot be set".
Yes
Is audio output normal?
No
Perform the check stated in item "Audio playback circuit".
Yes
Is recording/playback operation normal?
No
Perform the check stated in item "Recording/playback operation".

- **Power is not turned on when the ► / ►II button is pressed.**

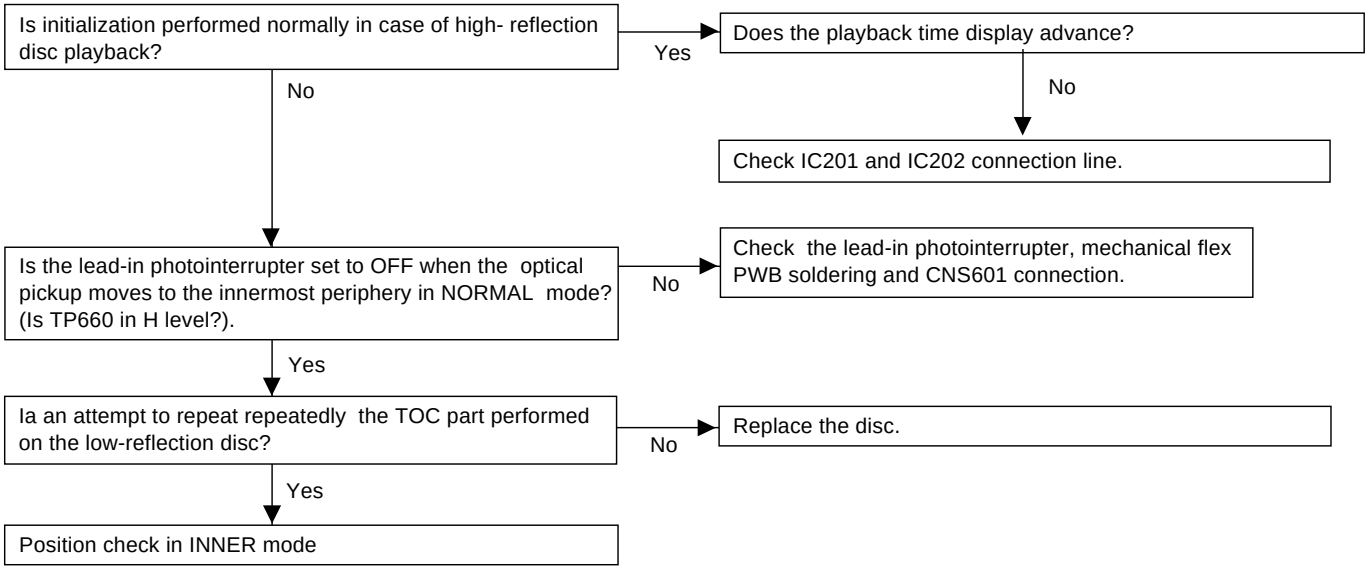

Is power turned on when the remote control ►II button is pressed?
No
Is operation normal when the main body button is pressed?
Yes
Check the periphery of remote controller and main unit headphone terminal (J703) and IC401.
No
Is the pin 5 of IC401 in H state?
No
Check the position of Hold switch.
Yes
Are IC401 pin 50 set to "L"?
No
Check the DISC IN (SW901) switch of mechanism PWB.
Yes
Is clock supplied to the pins 11 and 14 of IC401?
No
Check that voltage is applied to the periphery of IC403.
Yes
Is 2.5V applied to TP801?
No
Check whether there is solder touch of part connected to the +2.5V line.

• Abnormal display


Is waveform output from CNS 482 pins 1 to 3?
Are the pin7 (VCC) and pin 6 (GND) normal?
No
Is waveform output from IC 401 pins 45 to 47?
Yes
No
Check between IC401 and CNS482.
Check the periphery of IC401.
Yes
Check for pattern breakage of flexible PWB, check for defects of display microcomputer (replace the display unit).

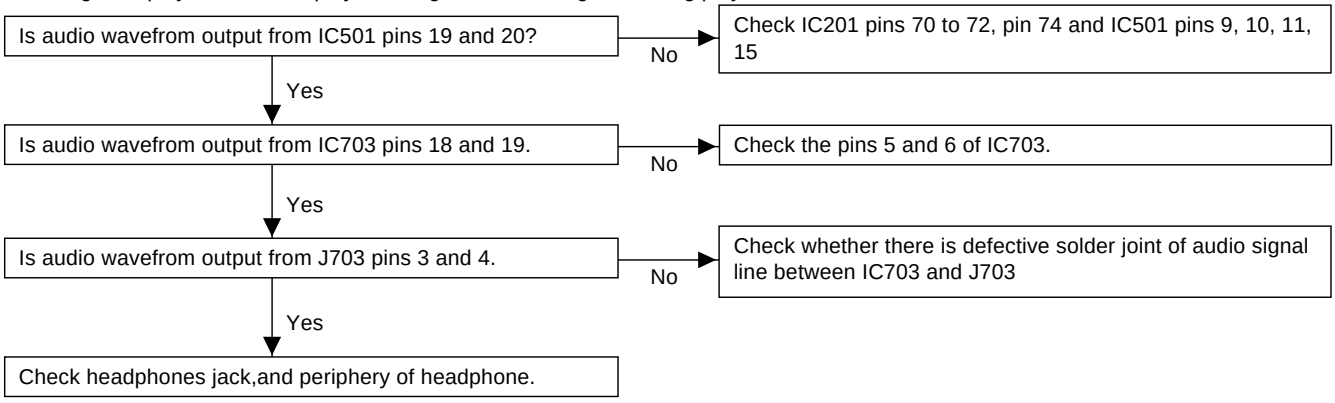
• Playback state cannot be set

When it has been ascertained that the address up to cluster address is normal in the TEST mode.

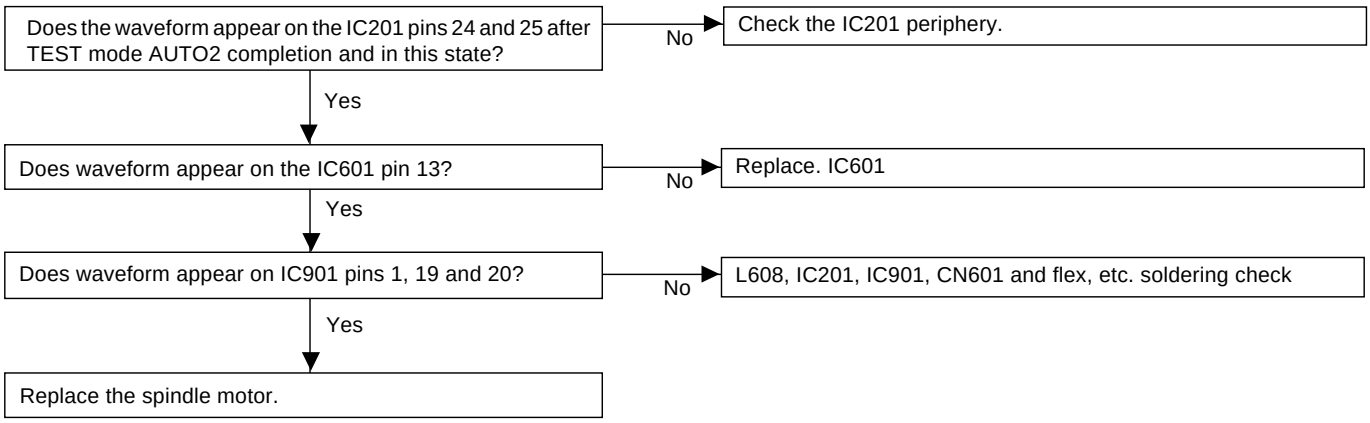

Is initialization performed normally in case of high- reflection disc playback?
Yes
Does the playback time display advance?
No
Check IC201 and IC202 connection line.
No
Is the lead-in photointerrupter set to OFF when the optical pickup moves to the innermost periphery in NORMAL mode? (Is TP660 in H level?).
No
Check the lead-in photointerrupter, mechanical flex PWB soldering and CNS601 connection.
Yes
Ia an attempt to repeat repeatedly the TOC part performed on the low-reflection disc?
No
Replace the disc.
Yes
Position check in INNER mode

• Audio playback clrcult

Although the playback time display is acting., no sound is given during playback in the normal mode.

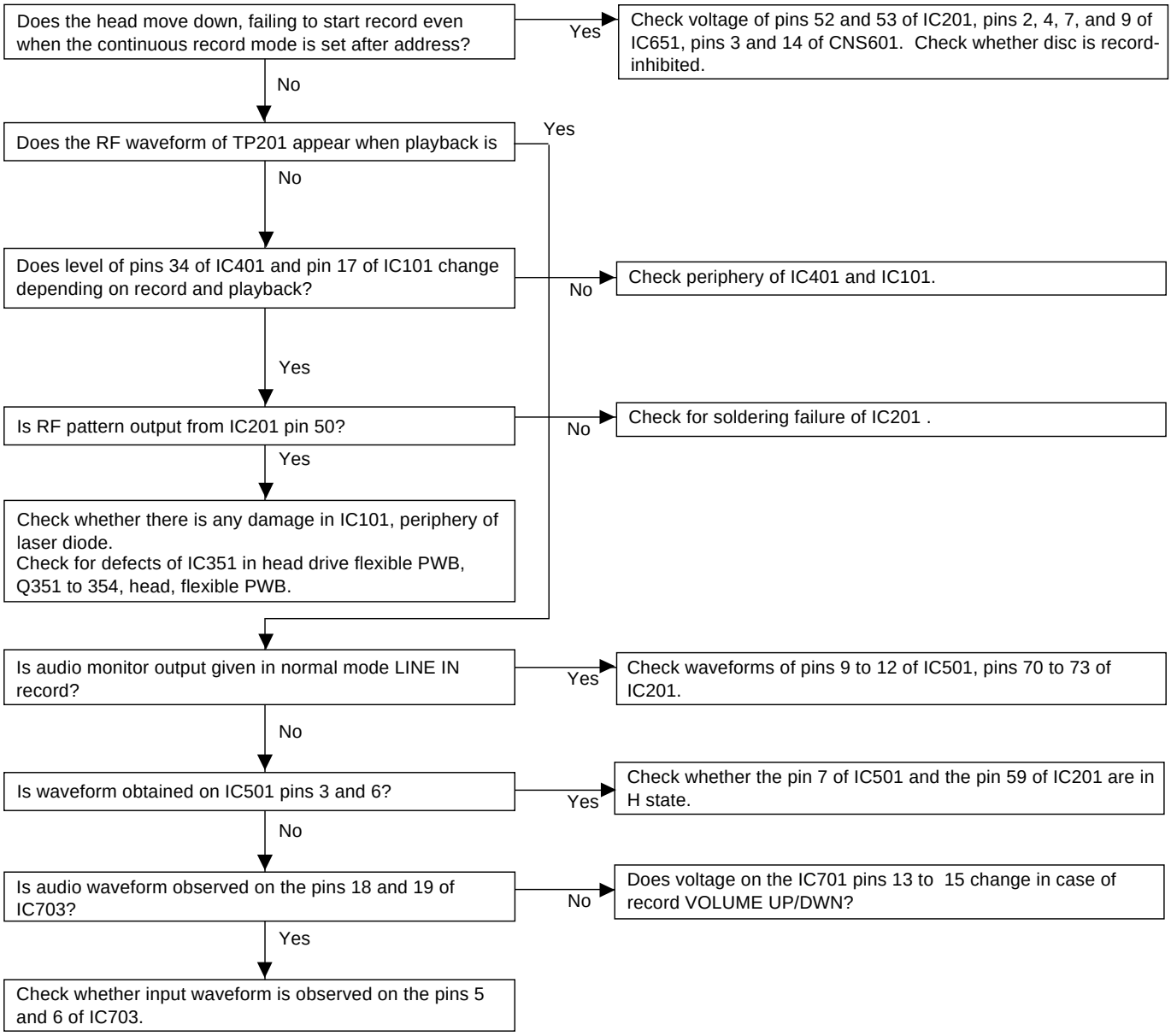

Is audio wavefrom output from IC501 pins 19 and 20?
No
Check IC201 pins 70 to 72, pin 74 and IC501 pins 9, 10, 11, 15
Yes
Is audio wavefrom output from IC703 pins 18 and 19.
No
Check the pins 5 and 6 of IC703.
Yes
Is audio wavefrom output from J703 pins 3 and 4.
No
Check whether there is defective solder joint of audio signal line between IC703 and J703
Yes
Check headphones jack,and periphery of headphone.

• The spindle motor fails to run.Does the head move


Does the waveform appear on the IC201 pins 24 and 25 after TEST mode AUTO2 completion and in this state?
No
Check the IC201 periphery.
Yes
Does waveform appear on the IC601 pin 13?
No
Replace. IC601
Yes
Does waveform appear on IC901 pins 1, 19 and 20?
No
L608, IC201, IC901, CN601 and flex, etc. soldering check
Yes
Replace the spindle motor.

• Recording/playback operation

Insert a low reflection disc, and ascertain audio output by normal playback, and then set TEST REC mode.


Does the head move down, failing to start record even when the continuous record mode is set after address?
Yes
Check voltage of pins 52 and 53 of IC201, pins 2, 4, 7, and 9 of IC651, pins 3 and 14 of CNS601. Check whether disc is record-inhibited.
No
Does the RF waveform of TP201 appear when playback is
Yes
No
Does level of pins 34 of IC401 and pin 17 of IC101 change depending on record and playback?
No
Check periphery of IC401 and IC101.
Yes
Is RF pattern output from IC201 pin 50?
No
Check for soldering failure of IC201 .
Yes
Check whether there is any damage in IC101, periphery of laser diode.
Check for defects of IC351 in head drive flexible PWB, Q351 to 354, head, flexible PWB.
Is audio monitor output given in normal mode LINE IN record?
Yes
Check waveforms of pins 9 to 12 of IC501, pins 70 to 73 of IC201.
No
Is waveform obtained on IC501 pins 3 and 6?
Yes
Check whether the pin 7 of IC501 and the pin 59 of IC201 are in H state.
No
Is audio waveform observed on the pins 18 and 19 of IC703?
No
Does voltage on the IC701 pins 13 to 15 change in case of record VOLUME UP/DWN?
Yes
Check whether input waveform is observed on the pins 5 and 6 of IC703.

FUNCTION TABLE OF IC

IC401 RH-iX2680AF03(IX2680AF):System Microcomputer (1/2)

Pin No.	Port Name	Terminal Name	Input/Output	Function
1	P120	SWP UP	Output	Asterisk input Output for pull-up
2*~7*	P121~P126	P121~P126	Output	Not used
8	P127	OEM	Input	Product brand ID input
9	VDD	VDD	Input	Positive power supply
10*	X2	X2	Input	Not used
11	X1	X1	Input	Main system clock input
12	VSS	VSS	Input	Ground potential
13*	XT2	XT2	Input	Not used
14	XT1	XT1	Input	Subsystem clock input
15	RESET	RESET	Input	Microcomputer hard reset input
16	INPUT0	DINT	Input	System LSI interruption request input
17	P01	SENSE	Input	System LSI servo sense input
18	P02	FOK	Input	Focus OK signal input
19	P03	XRST	Outout	System LSI hard reset output
20*	P04	P04	Output	Not used
21	P05	HDON	Output	Record head current control output
22	P06	VLIM	Intput	Volume limiting switch input
23	AVDD	AVDD	Input	A/D converter analog positive power
24	AVREF0	AVREF0	Input	A/D converter reference voltage input
25	ANI0	PLVINN	Input	Built-in battery voltage detection input
26	ANI1	PLVDCI	Input	DC jack voltage detection input
27	ANI2	PLVDRY	Input	Dry cell voltage detection input
28	ANI3	RKEY	Input	Remote controller key operation detection input
29	ANI4	HKEY1	Input	Main unit key operation detection input 1
30	ANI5	HKEY2	Input	Main unit key operation detection input 2
31	ANI6	TEMP	Input	Ambient temperature detection input
32	ANI7	CNTRY	Intput	Product destination ID input
33	AVSS	AVSS	Intput	A/D converter ground potential
34	ANO0	LDVAR	Output	P.U. laser power set output
35*	ANO1	MDOUT	Output	Internal motion mode output
36	AVREF1	AVREF1	Output	D/A converter reference voltage input
37	P70	SYWR	Output	System LSI write enable output
38	P71	SYRD	Output	System LSI read enable output
39	P72	SYRS	Output	System LSI register selection output
40	P20	-	Output	Not used
41	SO1	RMDAT	Output	Remote controller display data output
42	P22	-	Output	
43	P23	HSTOP	Input	Main unit STOP key operation detection input
44	P24/BUZ	BEEP	Output	Beep tone pulse output
45	P25	DSPSTB	Output	Main unit display control strobe output
46	SO0	DSPDAT	Output	Main unit display control serial data output
47	SCK0	DSPSCK	Output	Main unit display control serial clock output
48~55	P80~P87	SYD0~SYD7	In/Output	System LSI parallel data bus
56	P40	EJECT	Input	Eject lever operation detection input *
57	P41	KHOLD	Input	Main unit key hold switch input
58	P42	RPLAY	Input	Remote controller PLAY key operation detection input
59*	P43	HFON	Output	P.U. high frequency superposition control output

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.

IC401 RH-iX2680AF03(IX2680AF):System Microcomputer (2/2)

Pin No.	Port Name	Terminal Name	Input/Output	Function
60	P44	LDON	Output	P.U. laser ON/OFF control output
61	P45	OPICGA	Output	P.U. detection sensitivity selection output
62	P46	RFLAT	Output	RF amp. IC data latch output
63	P47	RACLK	Output	RF/audio IC data clock output
64	P50	RADAT	Output	RF/audio IC serial data output
65	P51	PBLAT	Output	Playback audio IC data latch output
66	P52	RCLAT	Output	Record audio IC data latch output
67	P53	PBOPON	Output	Audio IC output stage control output
68	P54	MCPGIN	Input	Mic plug insertion detection input
69	P55	INPGIN	Input	Line/digital plug insertion detection
70	P56	INPGCK	Input	Line/digital plug type detection
71	P57	RCPCNT	Output	Record circuit power control output
72	VSS	VSS	Output	Ground potential
73	P60	EMPHO	Output	Audio emphasis control output 0
74	P61	HPLAY	Input	Main unit PLAY key operation detection input
75	P62	HREC	Input	Main unit REC key operation detection input
76*	P63	RTCCE	Output	Clock IC chip enable control output
77*	P64	RTCWR	Output	Clock IC read/write control output
78	P65	CEDT	In/Output	Clock/EEPROM serial data input/output
79	P66	CECK	Output	Clock/EEPROM serial data input/output
80	P67	EPCS	Output	EEPROM chip selection output
81	VDD	VDD	Output	Positive power supply
82	T15	SPIN	Inout	Spindle motor FG pulse detection input
83*	P101	P101	Output	Spare for sled motor control
84*	P102	TEST0	Input	Test mode setting input 0
85*	P103	TEST1	Input	Test mode setting input 1
86	P30	PSLINN	Output	Built-in battery power selection output
87	P31	PSLDCI	Output	DC jack power selection output
88	P32	PSLDRY	Output	Dry cell power selection output
89*	P33	P33	Output	Spare for sled motor control
90	P34	ELON	Output	Remote controller EL light control output
91	T100	CIN	Input	Truck cross signal detection input
92	P36	PHOLD	Output	Dry cell power ON holding output
93	P37	PCNT1	Output	Power IC VREF feed control output
94	TEST/VPP	VPP	Output	Test/R-ROM write power input
95	P90	PCNT2	Output	Power IC VCC feed control output
96	P91	CKSTP	Output	Main clock stop control output
97	P92	DISCIN	Input	Disk insertion detection input
98	P93	INNSW	Input	Mechanism inner SW position detection input
99	P94	DISCPR	Input	Record enable/disable switch detection input
100	P95	PDCNT	Output	PD current control output for inner detection

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.

SHARP PARTS GUIDE

MODEL MD-MS701H
MD-MS702H(BL)
MD-MS702H(GY)

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following information.

1. MODEL NUMBER
2. REF. No.
3. PART NO.
4. DESCRIPTION

★ MARK: SPARE PARTS-DELIVERY SECTION

For U.S.A. only

Contact your nearest SHARP Parts Distributor to order.

For location of SHARP Parts Distributor,
Please call Toll-Free;
1-800-BE-SHARP

Explanation of capacitors/resistors parts codes

Capacitors

VCC ..... Ceramic type
VCK ..... Ceramic type
VCT ..... Semiconductor type
VC • • MF ..... Cylindrical type (without lead wire)
VC • • MN ..... Cylindrical type (without lead wire)
VC • • TV ..... Square type (without lead wire)
VC • • TQ ..... Square type (without lead wire)
VC • • CY ..... Square type (without lead wire)
VC • • CZ ..... Square type (without lead wire)
VC • • • • • • • • • J .. The 13th character represents capacity difference.
("J" ±5%, "K" ±10%, "M" ±20%, "N" ±30%,
"C" ±0.25 pF, "D" ±0.5 pF, "Z" +80-20%.)

If there are no indications for the electrolytic capacitors, error is ±20%.

Resistors

VRD ..... Carbon-film type
VRS ..... Carbon-film type
VRN ..... Metal-film type
VR • • MF ..... Cylindrical type (without lead wire)
VR • • MN ..... Cylindrical type (without lead wire)
VR • • TV ..... Square type (without lead wire)
VR • • TQ ..... Square type (without lead wire)
VR • • CY ..... Square type (without lead wire)
VR • • CZ ..... Square type (without lead wire)
VR • • • • • • • • • J .. The 13th character represents error.
("J" ±5%, "F" ±1%, "D" ±0.5%.)

If there are no indications for other parts, the resistors are ±5% carbon-film type.

NOTE:
Parts marked with "⚠" are important for maintaining the safety of the set.
Be sure to replace parts with specified ones for maintaining the safety and performance of the set.

MD-MS701H/MS702H

NO.	PART CODE	★	PRICE RANK	DESCRIPTION
INTEGRATED CIRCUITS				
IC101	VHIIR3R55//-1	J	AQ	RF Signal,Processor,IR3R55
IC201	VHILR37648B-1	J	BD	ENDEC,LR37648B
IC202	RH-IX2567AFZZ	J	BA	4M D-RAM,IX2567AF
IC351	VHI74ACT02F-1	J	AF	Head Driver,74ACT02F
IC401	RH-IX2680AF03	J	AX	System Microcomputer, IX2680AF
IC402	VHIS29L294A-1	J	AH	E^2-PROM,S29L294A
IC404	VHI7SH00FU/-1	J	AE	NAND Gate,7SH00FU
IC431	VHIS80821LN-1	J	AE	2.1V Reset,S80821LN
IC441	VHITC7W14FU-1	J	AF	Inverter,TC7W14FU
IC501	VHIAK4514VF-1	J	AT	AD/DA Converter,AK4514VF
IC601	VHIMPC17A39-1	J	AQ	Pickup Coil Driver,MPC17439
IC651	VHILB1638M/-1	J	AH	Motor Drive,LB1638M
IC701	VHIIR3R54N/-1	J	AQ	Audio Amp.,IR3R54N
IC702	VHITK71345M-1	J	AE	4.5V Regulator (ON/OFF), TK71354M
IC703	VHIIR3R54N/-1	J	AQ	Audio Amp.,IR3R54N
IC771	VHITK71225M-1	J	AE	2.5V Regulator,TK71225M
IC800	VHIHN1C03FU-1	J	AD	Voltage Regulator,HN1C03FU
IC801	VHIHAT1025R-1	J	AK	Power Select,HAT1025R
IC803	VHINDH831N/-1	J	AH	N-ch MOS FET,NDH831N
IC804	VHIRN4904//-1	J	AD	Power Select Charge Drive, RN4904
IC805	VHIUMD3N///-1	J	AC	Constant Current Drive,UMD3N
IC821	VHIIR3M09N/-1	J	AL	Power Drive,IR3M09N
IC841	VHIIR3M09N/-1	J	AL	Power Drive,IR3M09N
IC871	VHIS8327B30-1	J	AG	3V DC/DC Converter,S8327B30
IC872	VHITC7W32FU-1	J	AE	C-MOS Logic,TC7W32FU
IC873	VHIS80827LN-1	J	AE	2.7V Reset,S80827LN
IC874	VHITC7S00FU-1	J	AD	Charge Drive,TC7S00FU
IC875	VHITK71325M-1	J	AE	2.5V Regulator (ON/OFF), TK71325M
IC876	VHIRN4904//-1	J	AD	Power Select Charge Drive, RN4904
IC901	VHIBA6965FV-1	J	AN	Spindle Motor Driver,BA6965FV
TRANSISTORS				
Q101	VS2SA17457/-1	J	AB	Silicon,PNP,2SA17457
Q351	VS2SK2909//-1	J	AE	FET,2SK2909
Q352	VS2SK2911//-1	J	AE	FET,2SK2911
Q353	VS2SK2909//-1	J	AE	FET,2SK2909
Q354	VS2SK2911//-1	J	AE	FET,2SK2911
Q401	VS2SA17457/-1	J	AB	Silicon,PNP,2SA17457
Q711	VSRN1444A//-1	J	AC	Digital,NPN,RN1444 A
Q721	VS2SC4213B/-1	J	AC	Silicon,NPN,2SC4213 B
Q801	VS2SD1950//-1	J	AD	Silicon,NPN,2SD1950
Q802,803	VSDTC144EE/-1	J	AB	Digital,NPN,DTC144 EE
Q822	VHINDS335N/-1	J	AF	FET,NDS335N
Q842	VHINDS3335N/-1	J	AF	FET,NDS335N
Q871	VHINDS335N/-1	J	AF	FET,NDS335N
Q872	VSDTC144EE/-1	J	AB	Digital,NPN,DTC144 EE
Q873	VS2SJ305///-1	J	AF	FET,2SJ305
DIODES				
D201	VHD1SS369//-1	J	AD	Silicon,1SS369
D351,352	VHDSB0209CP-1	J	AC	Silicon,SB0209CP
D431	VHD1SS361//-1	J	AB	Silicon,1SS361
D491~493	VHE015Z5R1Y-1	J	AD	Zener,5.1V,015Z5.1Y
D494	VHE15AZ7R5Y-1	J	AC	Zener,7.5V,15AZ7.5Y
D800	VHDRB491D//-1	J	AD	Silicon,RB491D
D801	VHE015Z5R1Y-1	J	AD	Zener,5.1V,015Z5.1Y
D802	VHDSB10015C-1	J	AD	Silicon,SB10015C
D821	VHDF1J2F///-1	J	AE	Silicon,F1J2F
D822	VHDRB521S30-1	J	AC	Silicon,RB521S30
D831	VHD1SS372//-1	J	AD	Silicon,1SS372
D841	VHDF1J2F///-1	J	AE	Silicon,F1J2F
D842	VHDRB521S30-1	J	AC	Silicon,RB521S30
D861	VHDRB491D//-1	J	AD	Silicon,RB491D
D862	VHDRB521S30-1	J	AC	Silicon,RB521S30
D871	VHDRB491D//-1	J	AD	Silicon,RB491D
D873	VHD1SS372//-1	J	AD	Silicon,1SS372
D875	VHD1SS378//-1	J	AC	Silicon,1SS378
D877	VHD1SS360//-1	J	AB	Silicon,1SS360
PH901	VHPGP1S93K/-1	J	AF	Photo Interrupter,GP1S93K
COILS				
L100	VPBNN100M0000	J	AC	10 µH
L171	RCILC0333AFZZ	J	AC	10 µH,Choke
L201	VPBNNR47M0000	J	AC	0.47 µH
L202	VPBNN100M0000	J	AC	10 µH
L204	RCILC0353AFZZ	J	AB	Tip Impeder
L452	RCILC0352AFZZ	J	AB	Tip Impeder
L453,454	RCILC0290AFZZ	J	AC	Tip Solid Induction,200mA
L456	RCILC0290AFZZ	J	AC	Tip Solid Induction,200mA
L457,458	RCILC0290AFZZ	J	AC	Tip Solid Induction,200mA
L491	VPBNN4R7M0000	J	AC	4.7 µH
L500	VPANM4R7J0000	J	AC	4.7 µH
L600	RCILC0331AFZZ	J	AC	2.2 µH,Choke
L601~604	RCILR0559AFZZ	J	AC	47 µH
L608	RCILC0246AFZZ	J	AC	100 µH,Choke
L609,610	RCILR0559AFZZ	J	AC	47 µH
L651	VPBNNR47M0000	J	AC	0.47 µH
L702,703	RCILC0290AFZZ	J	AC	Tip Solid Induction,200mA
L704	RCILC0352AFZZ	J	AB	Tip Impeder
L710	VPBNNR47M0000	J	AC	0.47 µH
L711	RCILC0352AFZZ	J	AB	Tip Impeder
L712,713	RCILC0290AFZZ	J	AC	Tip Solid Induction,200mA
L714	RCILC0290AFZZ	J	AC	Tip Solid Induction,200mA
L751,752	RCILC0344AFZZ	J	AC	47 µH,Choke
L771	RCILR0559AFZZ	J	AC	47 µH
L772	VPANM4R7J0000	J	AC	4.7 µH
L801	RCILC0330AFZZ	J	AC	1 µH,Choke
L821	RCILC0332AFZZ	J	AC	4.7 µH,Choke
L822	RCILC0333AFZZ	J	AC	10 µH,Choke
L841	RCILC0332AFZZ	J	AC	4.7 µH,Choke
L842	RCILC0333AFZZ	J	AC	10 µH,Choke
L862	RCILR0559AFZZ	J	AC	47 µH
L863	RCILC0332AFZZ	J	AC	4.7 µH,Choke
L871	RCILR0559AFZZ	J	AC	47 µH
L886	VPBNNR47M0000	J	AC	0.47 µH
L887,888	RCORF0112AFZZ	J	AC	Core
VIBRATOR				
XL201	RCRSC0023AFZZ	J	AK	Crystal,33.8688 MHz
CAPACITORS				
C100	VCSAFA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C102,103	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C104	VCKYTV1EB273K	J	AB	0.027 µF,25V
C106	RC-KZ1189AFZZ	J	AC	0.22 µF,16V,Electrolytic
C107	VCKYTV1EB123K	J	AB	0.012 µF,25V
C109	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C110	RC-KZ1189AFZZ	J	AC	0.22 µF,16V,Electrolytic
C111	VCKYCY1HB332K	J	AA	0.0033 µF,50V
C112	VCKYCY1CB333K	J	AA	0.033 µF,16V
C121,122	VCCCCY1HH271J	J	AA	270 pF (CH),50V
C123,124	VCCSCY1HL391J	J	AA	390 pF,50V
C130	VCKYTV1CB104K	J	AA	0.1 µF,16V
C131	VCCCCY1HH331J	J	AA	330 pF (CH),50V
C161	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C165	VCKYCY1CB333K	J	AA	0.033 µF,16V
C171,172	VCSAFB0JJ336M	J	AE	33 µF,6.3V,Electrolytic,Tantalum
C201	VCKYTV1CF105Z	J	AB	1 µF,16V
C202	VCSAFA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C203	VCKYCY1CB104K	J	AB	0.1 µF,16V
C205	VCKYCY1CB104K	J	AB	0.1 µF,16V
C207	VCKYCY1CB104K	J	AB	0.1 µF,16V
C211,212	VCCCCY1HH5R0C	J	AA	5 pF (CH),50V
C351	VCCCCY1HH101J	J	AA	100 pF (CH),50V
C353	VCSAFA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C354	VCKYCY1CB104K	J	AB	0.1 µF,16V
C357	VCKYCY1CB104K	J	AB	0.1 µF,16V
C361	VCKYTV1HB393K	J	AB	0.039 µF,50V
C401	VCKYCY1CB104K	J	AB	0.1 µF,16V
C431	VCKYCY1CB473K	J	AA	0.047 µF,16V
C441	VCCCCY1HH100D	J	AA	10 pF (CH),50V
C442	VCKYCY1HB681K	J	AA	680 pF,50V
C443	RC-KZ1191AFZZ	J	AC	0.47 µF,10V,Electrolytic
C451	VCKYCY1HB102K	J	AA	1000 pF,50V
C481	VCKYCY1CB104K	J	AB	0.1 µF,16V
C491	VCKYTV1CB104K	J	AA	0.1 µF,16V
C500	VCSAFA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C501,502	VCKYCY1HB222K	J	AA	0.0022 µF,50V
C503,504	VCSAFA1AJ335M	J	AD	3.3 µF,10V
C507	VCSAFA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C508	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C509,510	VCKYTV1CF225Z	J	AC	2.2 µF,16V

NO.	PART CODE	★	PRICE RANK	DESCRIPTION
C600	VCSAFB1AJ156M	J	AE	15 µF,10V,Electrolytic,Tantalum
C601~604	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C608	RC-KZ1216AFZZ	J	AD	3.3 µF,10V,Electrolytic
C609,610	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C622	VCKYTV1CF225Z	J	AC	2.2 µF,16V
C651	VCKYTV1CF105Z	J	AB	1 µF,16V
C701,702	VCSAFA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C703	VCKYCY1EB103K	J	AA	0.01 µF,25V
C710	VCKYCY1CB104K	J	AB	0.1 µF,16V
C711,712	VCCCCY1HH101J	J	AA	100 pF (CH),50V
C713,714	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C715	VCKYCY1CB104K	J	AB	0.1 µF,16V
C721,722	VCSAFA1AJ335M	J	AD	3.3 µF,10V
C723,724	VCKYCY1HB102K	J	AA	1000 pF,50V
C725,726	VCSAFA1AJ335M	J	AD	3.3 µF,10V
C727	VCKYTV1CF105Z	J	AB	1 µF,16V
C731	VCKYCY1CF224Z	J	AB	0.22 µF,16V
C733,734	VCKYTV1CB104K	J	AA	0.1 µF,16V
C735	VCKYCY1HB102K	J	AA	1000 pF,50V
C736	VCKYCY1EB103K	J	AA	0.01 µF,25V
C751,752	VCKYTV1EB823K	J	AB	0.082 µF,25V
C753,754	VCKYTV1CF105Z	J	AB	1 µF,16V
C755	VCKYCY1EB103K	J	AA	0.01 µF,25V
C756,757	VCKYTV1AB684K	J	AC	0.68 µF,10V
C758	VCSAFA1AJ335M	J	AD	3.3 µF,10V
C759	VCKYCY1CB563K	J	AB	0.056 µF,16V
C761,762	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C767,768	RC-KZ1189AFZZ	J	AC	0.22 µF,16V,Electrolytic
C771,772	VCSAFB0JJ336M	J	AE	33 µF,6.3V,Electrolytic,Tantalum
C773	RC-KZ1189AFZZ	J	AC	0.22 µF,16V,Electrolytic
C774	VCKYTV1CF105Z	J	AB	1 µF,16V
C775	VCKYCY1EB103K	J	AA	0.01 µF,25V
C802	VCKYTV1CF105Z	J	AB	1 µF,16V
C803	VCKYTV1CB104K	J	AA	0.1 µF,16V
C804	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C805	VCEAPW0JW107M	J	AD	100 µF,6.3V,Electrolytic
C806	RC-KZ1216AFZZ	J	AD	3.3 µF,10V,Electrolytic
C807	VCKYTV1CB104K	J	AA	0.1 µF,16V
C808	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C810	RC-KZ1190AFZZ	J	AC	0.33 µF,10V,Electrolytic
C821	VCEAPW0GW227M	J	AD	220 µF,4.0V,Electrolytic
C822	VCCCCY1HH390J	J	AA	39 pF (CH),50V
C823,824	VCCCCY1HH101J	J	AA	100 pF (CH),50V
C825	VCCCCY1HH680J	J	AA	68 pF (CH),50V
C826	RC-KZ1198AFZZ	J	AC	1 µF,10V,Electrolytic
C827	RC-KZ1216AFZZ	J	AD	3.3 µF,10V,Electrolytic
C828	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C829	VCKYCY1EB103K	J	AA	0.01 µF,25V
C830	VCKYCY1HB102K	J	AA	1000 pF,50V
C831,832	VCKYCY1CB104K	J	AB	0.1 µF,16V
C842	VCCCCY1HH220J	J	AA	22 pF (CH),50V
C843,844	VCCCCY1HH101J	J	AA	100 pF (CH),50V
C845	VCCCCY1HH470J	J	AA	47 pF (CH),50V
C846	RC-KZ1198AFZZ	J	AC	1 µF,10V,Electrolytic
C847	RC-KZ1217AFZZ	J	AE	10 µF,10V,Electrolytic
C848	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C849	VCKYCY1EB103K	J	AA	0.01 µF,25V
C850	VCKYCY1HB102K	J	AA	1000 pF,50V
C863	RC-KZ1198AFZZ	J	AC	1 µF,10V,Electrolytic
C864	VCSAFB0JJ336M	J	AE	33 µF,6.3V,Electrolytic,Tantalum
C865,866	RC-KZ1198AFZZ	J	AC	1 µF,10V,Electrolytic
C868	VCKYTV1CF105Z	J	AB	1 µF,16V
C869	VCSAFB0JJ336M	J	AE	33 µF,6.3V,Electrolytic,Tantalum
C871,872	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C873	VCKYTV1CF105Z	J	AB	1 µF,16V
C874	VCSAFA1AJ106M	J	AD	10 µF,10V,Electrolytic,Tantalum
C875	RC-KZ1189AFZZ	J	AC	0.22 µF,16V,Electrolytic
C877	VCSAFA0JJ106M	J	AD	10 µF,6.3V,Electrolytic,Tantalum
C878	RC-KZ1216AFZZ	J	AD	3.3 µF,10V,Electrolytic
C879	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C880	VCKYCY1EB103K	J	AA	0.01 µF,25V
C881	RC-KZ1193AFZZ	J	AC	1 µF,6.3V,Electrolytic
C886	VCSAFA1AJ106M	J	AD	10 µF,10V,Electrolytic,Tantalum
C902	VCKYCY1EB103K	J	AA	0.01 µF,25V
C903	RC-KZ1216AFZZ	J	AD	3.3 µF,10V,Electrolytic
C905~907	VCKYCY1HB222K	J	AA	0.0022 µF,50V
C908	RC-KZ1191AFZZ	J	AC	0.47 µF,10V,Electrolytic
C909,910	VCKYCY1CB473K	J	AA	0.047 µF,16V
C911	VCKYCY1CB104K	J	AB	0.1 µF,16V
C951,952	VCSAFE0GJ476M	J	AE	47 µF,4.0V,Electrolytic,Tantalum

RESISTORS

NO.	PARTS CODE	★	PRICE RANK	DESCRIPTION
	VRS-CY1JB000J	J	AA	0 ohm,Jumper,0.8×1.55mm, Green
	VRS-TV2AB000J	J	AA	0 ohm,Jumper,1.25×2mm,Green
R101~104	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R105	VRS-CY1JB394J	J	AA	390 kohms,1/16W
R106	VRS-CY1JB563J	J	AA	56 kohms,1/16W
R154	VRS-CY1JB122J	J	AA	1.2 kohms,1/16W
R161	VRS-CY1JB122J	J	AA	1.2 kohms,1/16W
R203	VRS-CY1JB101J	J	AA	100 ohm,1/16W
R204	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R205	VRS-CY1JB564D	J	AA	560 kohms,1/16W
R206	VRS-CY1JB224D	J	AA	220 kohms,1/16W
R207	VRS-CY1JB681J	J	AA	680 ohms,1/16W
R222	VRS-CY1JB105J	J	AA	1 Mohm,1/16W
R361	VRS-TQ2BB8R2J	J	AB	8.2 ohms,1/8W
R400	VRS-CY1JB392J	J	AA	3.9 kohms,1/16W
R402	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R403	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R404	VRS-CY1JB154J	J	AA	150 kohms,1/16W
R405	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R406	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R407	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R408,409	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R411	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R412	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R413~415	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R419,420	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R421	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R422	VRS-CY1JB333J	J	AA	33 kohms,1/16W
R423	VRS-CY1JB223D	J	AA	22 kohms,1/16W
R424,425	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R426	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R431	VRS-CY1JB334J	J	AA	330 kohms,1/16W
R441	VRS-CY1JB123J	J	AA	12 kohms,1/16W
R442	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R443	VRS-CY1JB393J	J	AA	39 kohms,1/16W
R444	VRS-CY1JB272J	J	AA	2.7 kohms,1/16W
R451	VRS-CY1JB562J	J	AA	5.6 kohms,1/16W
R452	VRS-CY1JB822J	J	AA	8.2 kohms,1/16W
R453	VRS-CY1JB183J	J	AA	18 kohms,1/16W
R454	VRS-CY1JB563J	J	AA	56 kohms,1/16W
R455	VRS-CY1JB562J	J	AA	5.6 kohms,1/16W
R456	VRS-CY1JB822J	J	AA	8.2 kohms,1/16W
R457	VRS-CY1JB183J	J	AA	18 kohms,1/16W
R458	VRS-CY1JB563J	J	AA	56 kohms,1/16W
R481	VRS-CY1JB363D	J	AA	36 kohms,1/16W
R482	VRS-CY1JB183D	J	AA	18 kohms,1/16W
R492	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R500	VRS-CY1JB4R7J	J	AA	4.7 ohms,1/16W
R501,502	VRS-CY1JB471J	J	AA	470 ohms,1/16W
R503,504	VRS-CY1JB203J	J	AA	20 kohms,1/16W
R601	VRS-CY1JB563J	J	AA	56 kohms,1/16W
R701,702	VRS-CY1JB101J	J	AA	100 ohm,1/16W
R703	VRS-CY1JB154J	J	AA	150 kohms,1/16W
R711,712	VRS-CY1JB562J	J	AA	5.6 kohms,1/16W
R713,714	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R715,716	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R717	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R719,720	VRS-CY1JB822J	J	AA	8.2 kohms,1/16W
R723,724	VRS-CY1JB682J	J	AA	6.8 kohms,1/16W
R725	VRS-CY1JB101J	J	AA	100 ohm,1/16W
R726	VRS-CY1JB393J	J	AA	39 kohms,1/16W
R727	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R728	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R729,730	VRS-CY1JB272J	J	AA	2.7 kohms,1/16W
R751,752	VRS-CY1JB820J	J	AA	82 ohms,1/16W
R753	VRS-CY1JB154J	J	AA	150 kohms,1/16W
R754	VRS-CY1JB334J	J	AA	330 kohms,1/16W
R756,757	VRS-CY1JB273J	J	AA	27 kohms,1/16W
R761,762	VRS-CY1JB332J	J	AA	3.3 kohms,1/16W
R765,766	VRS-CY1JB150J	J	AB	15 ohms,1/16W
R767,768	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R801	VRS-CY1JB684D	J	AA	680 kohms,1/16W
R802	VRS-CY1JB394D	J	AA	390 kohms,1/16W
R803,804	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R805	VRS-CY1JB474D	J	AA	470 kohms,1/16W
R806	VRS-CY1JB684D	J	AA	680 kohms,1/16W
R807	VRS-CY1JB273D	J	AA	27 kohms,1/16W
R808	VRS-CY1JB393D	J	AA	39 kohms,1/16W
R809	VRS-CY1JB104J	J	AA	100 kohm,1/16W

NO.	PART CODE	★	PRICE RANK	DESCRIPTION
R810,811	VRS-CY1JB184D	J	AA	180 kohms,1/16W
R814,815	VRS-CY1JB392D	J	AA	3.9 kohms,1/16W
R816	VRS-CY1JB122D	J	AA	1.2 kohms,1/16W
R817	VRS-TV2AB223J	J	AA	22 kohms,1/10W
R818	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R819	VRS-CY1JB271J	J	AA	270 ohms,1/16W
R821	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R823	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R824	VRS-CY1JB153J	J	AA	15 kohms,1/16W
R826	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R827	VRS-CY1JB304D	J	AA	300 kohms,1/16W
R828	VRS-CY1JB274D	J	AA	270 kohms,1/16W
R829	VRS-CY1JB333J	J	AA	33 kohms,1/16W
R831	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R832	VRS-CY1JB335J	J	AA	3.3 Mohms,1/16W
R841	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R843	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R844	VRS-CY1JB153J	J	AA	15 kohms,1/16W
R846	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R847	VRS-CY1JB334D	J	AA	330 kohms,1/16W
R848	VRS-CY1JB224D	J	AA	220 kohms,1/16W
R849	VRS-CY1JB333J	J	AA	33 kohms,1/16W
R851	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R852	VRS-CY1JB155J	J	AA	1.5 Mohms,1/16W
R861	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R872	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R873	VRS-CY1JB102J	J	AA	1 kohm,1/16W
R874	VRS-CY1JB474J	J	AA	470 kohms,1/16W
R875~882	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R901,902	VRS-CY1JB1R0J	J	AA	1 ohm,1/16W
R903	VRS-CY1JB151J	J	AA	150 ohms,1/16W
R904	VRS-CY1JB223J	J	AA	22 kohms,1/16W
R905	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R906	VRS-CY1JB274J	J	AA	270 kohms,1/16W
R907	VRS-CY1JB184J	J	AA	180 kohms,1/16W
R908	VRS-CY1JB104J	J	AA	100 kohm,1/16W
R909	VRS-CY1JB103J	J	AA	10 kohm,1/16W
R921	VRS-CY1JB331J	J	AA	330 ohms,1/16W
R922	VRS-CY1JB104J	J	AA	100 kohm,1/16W

OTHER CIRCUITRY PARTS

CN101	QCNCW801XAFZZ	J	AH	Socket,22Pin
CN451	QCNCW749PAFZZ	J	AE	Socket,14Pin
CN482	QCNCW804GAFZZ	J	AD	Socket,7Pin
CN601	QCNCW804RAFZZ	J	AE	Socket,16Pin
CN701	QCNCWWQ33AFZZ	J	AE	Socket,33Pin
J701	VHPGP1FB65R-1	J	AP	Jack,LINE
J702	QJAKM0189AFZZ	J	AE	Jack,MIC IN
J703	QJAKM0201AFZZ	J	AH	Jack,Headphones
J801	QJAKC0136AFZZ	J	AD	Jack,DC IN
M901	RMOTV0500AFZZ	J	AT	Motor Ass'y [Spindle]
M902	RMOTV0503AFZZ	J	AF	Motor Ass'y [Sled]
M903	RMOTV0501AFM1	J	AS	Motor Ass'y [Lift]
SW401	QSW-M0171AFZZ	J	AC	Switch,Push Type [EJECT]
SW402	QSW-S0948AFZZ	J	AC	Switch,Slide Type [HOLD]
SW901	QSW-M0169AFZZ	J	AD	Switch,Push Type [Disc In]
SW902	QSW-M0170AFZZ	J	AD	Switch,Push Type [Disc Protect]

MECHANICAL PARTS

1	NGERH0597AFZZ	J	AC	Wheel,Drive
2	NSFTD0328AFZZ	J	AE	Screw,Drive
3	LHLDX3136AFM1	J	AH	Cartridge Holder Ass'y
4	MSPRT1607AFFJ	J	AB	Spring,Cancel Lever
5	MLEVF2598AFFW	J	AD	Lever,Eject
6	LCHSM0931AFM1	J	AN	Main Chassis Ass'y
7	PCUSG0599AFZZ	J	AB	Cushion
8	QPWBH0306AFM1	J	AQ	Mechanism Flexible PWB Ass'y
8- 1	————	J	—	Mechanism Flexible PWB (Not Replacement Item)
8- 2(SW901)	QSW-M0169AFZZ	J	AD	Switch,Push Type [Disc In]
8- 3(SW902)	QSW-M0170AFZZ	J	AD	Switch,Push Type [Disc Protect]
8- 4(PH901)	VHPGP1S93K/-1	J	AF	Photo Interrupter,GP1S93K
11	MSPRP0881AFFJ	J	AB	Spring,
13	NGERH0596AFZZ	J	AD	Gear,Drive
15	RCTRH8175AFZZ	J	BM	Optical Pickup Unit
16	MSPRP0880AFFJ	J	AC	Spring,Drive Grip
18	NSFTM0292AFFW	J	AC	Shaft,Guide
20	MSPRT1604AFFJ	J	AB	Spring,Eject Lever
23	QPWBH0307AFZZ	J	AF	Magnetic Head Flexible PWB
25	MLEVF2599AFM1	J	AE	Lift Lever Ass'y
26	NGERH0595AFZZ	J	AC	Gear,Lift Drive
28	MLEVF2600AFFW	J	AD	Lever,Lift
29	MSPRD1353AFFJ	J	AB	Spring,Lift Lever
30	LANGF1588AFFW	J	AD	Bracket,Pickup
32	RCILH0109AFZZ	J	AN	Magnetic Head
501	XSPSN14P01800	J	AA	Screw,ø1.4×1.8mm
502	LX-JZ0154AFZZ	J	AA	Screw,ø1.4×2.8mm
503	LX-BZ0823AFZZ	J	AA	Screw,ø1.4×1.2mm
504	LX-WZ9290AFZZ	J	AA	Washer,ø0.8×ø2.4×0.25mm
505	LX-BZ0800AFZZ	J	AA	Screw,ø1.4×2.5mm
506	LX-JZ0146AFZZ	J	AA	Screw,ø1.7×2.5mm
507	LX-BZ0804AFFF	J	AA	Screw,ø1.4×2.2mm
508	LX-BZ0960AFZZ	J	AB	Screw,ø1.4×1.5mm
509	XSPSN14P01200	J	AA	Screw,ø1.4×1.2mm
510	LX-WZ9164AFZZ	J	AA	Washer,ø1×ø2.4×0.25mm
511	LX-BZ0959AFZZ	J	AB	Screw,ø1.4×1.8mm
512	LX-WZ9293AFZZ	J	AA	Washer,ø2.7×ø5×0.25mm
513	LX-WZ9294AFZZ	J	AA	Washer,ø1×ø2.4×0.15mm
M901	RMOTV0500AFZZ	J	AT	Motor Ass'y [Spindle]
M902	RMOTV0503AFZZ	J	AF	Motor Ass'y [Sled]
M903	RMOTV0501AFM1	J	AS	Motor Ass'y [Lift]

CABINET PARTS

201	GCABB2841AFSB	J	AG	Front Cabinet [702H GY]
201	GCABB2841AFSC	J	AG	Front Cabinet [701H]
201	GCABB2841AFSG	J	AG	Front Cabinet [702H BL]
202	CCABD4342AF01	J	AX	Bottom Cabinet Ass'y [702H GY]
202	CCABD4342AF03	J	AX	Bottom Cabinet Ass'y [702H BL]
202	CCABD4352AF01	J	AX	Bottom Cabinet Ass'y [701H]
202- 1	————		—	Bottom Cabinet (Not Replacement Item)
202- 2	GCOVA2218AFSA	J	AB	Cover,DC Jack
202- 3	JKNBZ2040AFSA	J	AD	Knob,HOLD
202- 4	PSHET0371AFZZ	J	AC	Sheet,Bottom Cabinet
203	GFTAB1348AFSA	J	AC	Lid,Battery [701H]
203	GFTAB1348AFSB	J	AC	Lid,Battery [702H GY]
203	GFTAB1348AFSG	J	AF	Lid,Battery [702H BL]
205	GCOVA2217AFSA	J	AD	Cover,Eject [701H]
205	GCOVA2217AFSB	J	AD	Cover,EJECT [702H GY]
205	GCOVA2217AFSF	J	AD	Cover,EJECT [702H BL]
206	QTANZ9150AFFQ	J	AC	Battery Terminal,-
207	QTANZ9149AFFQ	J	AC	Battery Terminal,+
208	JKNBK0526AFSA	J	AE	Knob,Eject
209	LANGK0934AFM1	J	AN	Main Frame Ass'y
210	PCUSG0649AFZZ	J	AB	Cushion Machanism
211	PSHET0373AFZZ	J	AC	Sheet
213	LANGZ0334AFM1	J	AN	Eject Bracket Ass'y
214	PCUSG0635AFZZ	J	AA	Rubber,Preventive Vibration B
215	PCUSG0636AFZZ	J	AA	Rubber,Preventive Vibration C
216	GCABA2839AFSA	J	AF	Center Cabinet [701H]
216	GCABA2839AFSB	J	AF	Center Cabinet [702H GY]
216	GCABA2839AFSF	J	AF	Center Cabinet [702H BL]
217	PCUSG0534AFZZ	J	AC	Rubber,Preventive Vibration
219	PSHET0378AFZZ	J	AB	Sheet,Extention Battery Terminal
220	QTANZ9151AFFQ	J	AG	Extention Battery Terminal
221	CCABC4329AF01	J	AY	Top Cabinet Ass'y [701H]
221	CCABC4330AF01	J	AZ	Top Cabinet Ass'y [702H GY]
221	CCABC4330AF05	J	BA	Top Cabinet Ass'y [702H BL]
221- 1	————		—	Top Cabinet
221- 2	HDECQ0528AFSA	J	AG	Transparent Plate [701H]
221- 2	HDECQ0533AFSA	J	AG	Transparent Plate [702H]
221- 3	HDECQ0529AFSA	J	AM	Decoration Plate [701H]
221- 3	HDECQ0529AFSB	J	AM	Decoration Plate [702H]
221- 4	PSHEZ0817AFZZ	J	AC	Sheet,Transparent Plate
221- 5	PSHEZ0818AFZZ	J	AC	Sheet,Decoration Plate
226	LANGK0935AFFW	J	AH	Bracket,Knob
227	LHLDZ1706AFZZ	J	AD	Holder,LCD
228	PCUSG0648AFZZ	J	AB	Cushion,LCD
229	PCUSG0651AFZZ	J	AB	Cushion,Bracket
231	RUNTK0442AFZZ	J	AP	Key Flexible PWB Ass'y
232	RUNTZ0655AFZZ	J	AZ	LCD
233	JKNBZ2042AFSA	J	AK	Knob,Operation A [701H]
233	JKNBZ2042AFSB	J	AF	Knob,Oparetion A [702H]
234	JKNBZ2043AFSA	J	AE	Knob,Operation D [701H]
234	JKNBZ2047AFSA	J	AG	Knob,Operation D [702H GY]
234	JKNBZ2047AFSB	J	AH	Knob,Operation D [702H BL]
235	JKNBZ2044AFSA	J	AC	Knob,Operation B
236	JKNBZ2045AFSA	J	AC	Knob,REC [701H]
236	JKNBZ2048AFSA	J	AC	Knob,REC [702H]
237	PCUSG0637AFZZ	J	AB	Cushion A
238	PCUSG0652AFZZ	J	AB	Cushion,Bracket

NO.	PART CODE	★	PRICE RANK	DESCRIPTION
239	PSPAZ0532AFZZ	J	AC	Spacer Mechanism
240	PSHET0375AFZZ	J	AB	Sheet,LCD
241	HDECB0458AFSA	J	AB	Decoration Screw [702H Only]
242	HDECQ0530AFSA	J	AL	Decoration Ring [702H GY]
242	HDECQ0530AFSB	J	AN	Decoration Ring [702H BL]
244	PCUSG0646AFZZ	J	AB	Cushion,Jack
245	PCUSG0649AFZZ	J	AB	Cushion,Switch
246	PSHEZ0851AFZZ	J	AC	Bracket,Eject Knob
247	PCUSG0646AFZZ	J	AB	Rubber,Prevention Vibration
248	GFTAC3135AFSA	J	AG	Cover,MD
249	LANGZ0335AFFW	J	AB	Bracket,Disc Guide
250	PCUSG0638AFZZ	J	AA	Rubber,Prevention Vibration D
251	PGIDM0256AFSA	J	AB	Guide (Left)
253	PCUSG0647AFZZ	J	AB	Cushion DC
254	QPWBH0308AFZZ	J	AE	Audio Flexible PWB
255	PSPAZ0532AFZZ	J	AC	Mechanism Spacer
256	PSHET0382AFZZ	J	AB	Sheet,Jack
257	TLABS0465AFZZ	J	AB	Label,Laser Mark
258	TLABS0497AFZZ	J		Label,Laser Caution
601	LX-BZ0908AFF3	J	AA	Screw,ø1.4×2.0mm
603	LX-CZ0107AFFF	J	AA	Screw,ø1.2×2.5mm
605	LX-CZ0126AFFF	J	AA	Screw,ø1.4×2.0mm
606	LX-BZ0877AFF3	J	AA	Screw,ø1.4×1.5mm
608	LX-BZ0805AFFN	J	AB	Screw,ø1.7×2.5mm
610	LX-BZ0908AFFC	J	AB	Screw,ø1.4×2mm

ACCESSORIES/PACKING PARTS

1	SPAKZ0475AFZZ	J		Pad,Operation Manual
2	QCNWG0382AFZZ	J	AK	Connecting Cord,RCA Type
3	RADPA7407AFZZ	J	BF	AC Adaptor [For Europe]
3	RADPA8404AFZZ	J	BK	AC Adaptor [For UK]
4	RPHOH0176AFZZ	J	AR	Headphones
5	RRMCW0024AFZZ	J	BB	Remote Control
6	SPAKA2679AFZZ	J	AD	Packing Add.
7	SPAKC6529AFZZ	J	AL	Packing Case [702H GY]
7	SPAKC6530AFZZ	J		Packing Case [702H BL]
7	SPAKC6552AFZZ	J		Packing Case [701H]
8	SSAKH0314AFZZ	J	AD	Polyethylene Bag,Unit
9	TCADS0085AFZZ	J	AD	Service Card [For UK Only]
10	SPAKZ0479AFZZ	J		Sheet
11	TINSE1633AFZZ	J	AH	Operation Manual [For UK]
11	TINSZ1336AFZZ	J	AR	Operation Manual [For Europe]
12	TLABM0592AFZZ	J	AD	Label,Feature
13	SPAKZ0465AFZZ	J		Pad,AC Adaptor
14	UBAGC0076AFSA	J	AH	Carrying Bag
15	UBATI0060AFSA	J	BH	Rechargeable,Battery

P.W.B. ASSEMBLY (Not Replacement Item)

PWB-A1,2	DCYO-3035AF93	J	—	Main/Jack (Combined Ass'y)

OTHER SERVICE PARTS

QCNWK0110AFZZ	J		Flat Cable for Service,16Pin
RUNTK0460AFZZ	J		Extention Connector Unit for Service,16Pin
UDSKM0001AFZZ	J	AZ	Recording Mini Disc
88GMMD-110	J	BV	High Reflection,MMD-110 (TEAC Test MD)
88GMMD-212	J	BU	Low Reflection,MMD-212 (TEAC Test MD)

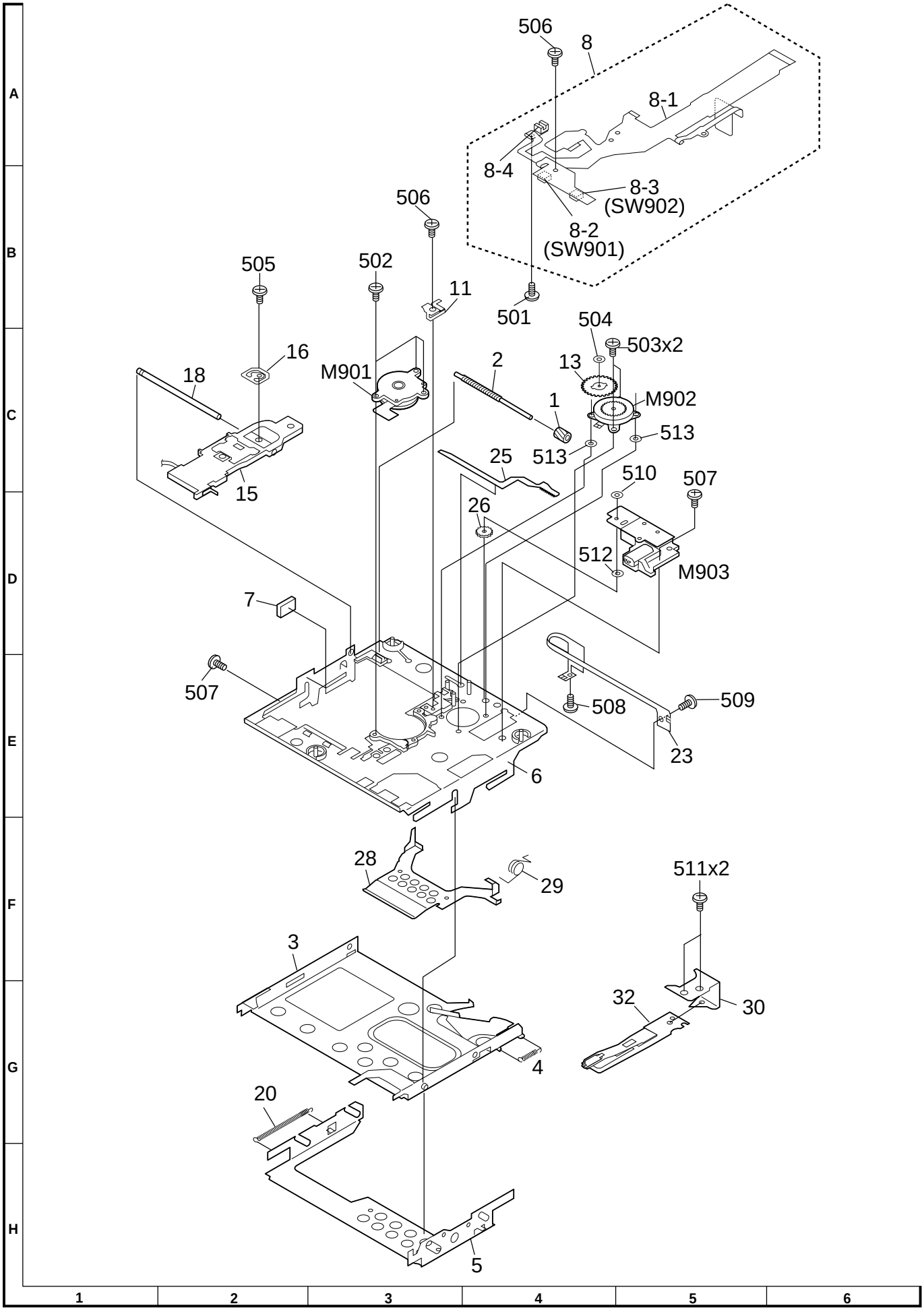


Figure 5 MD MECHANISM EXPLODED VIEW

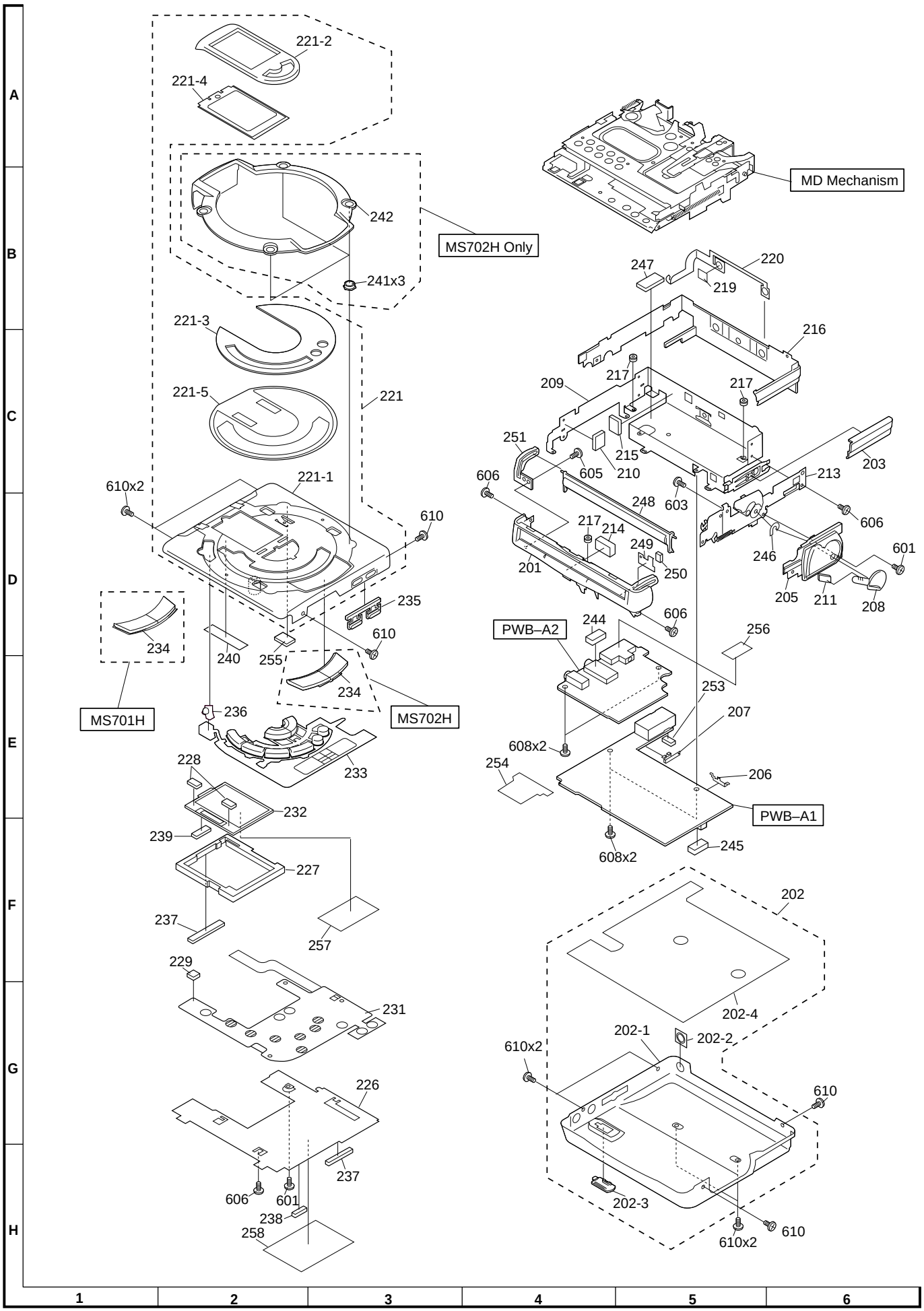
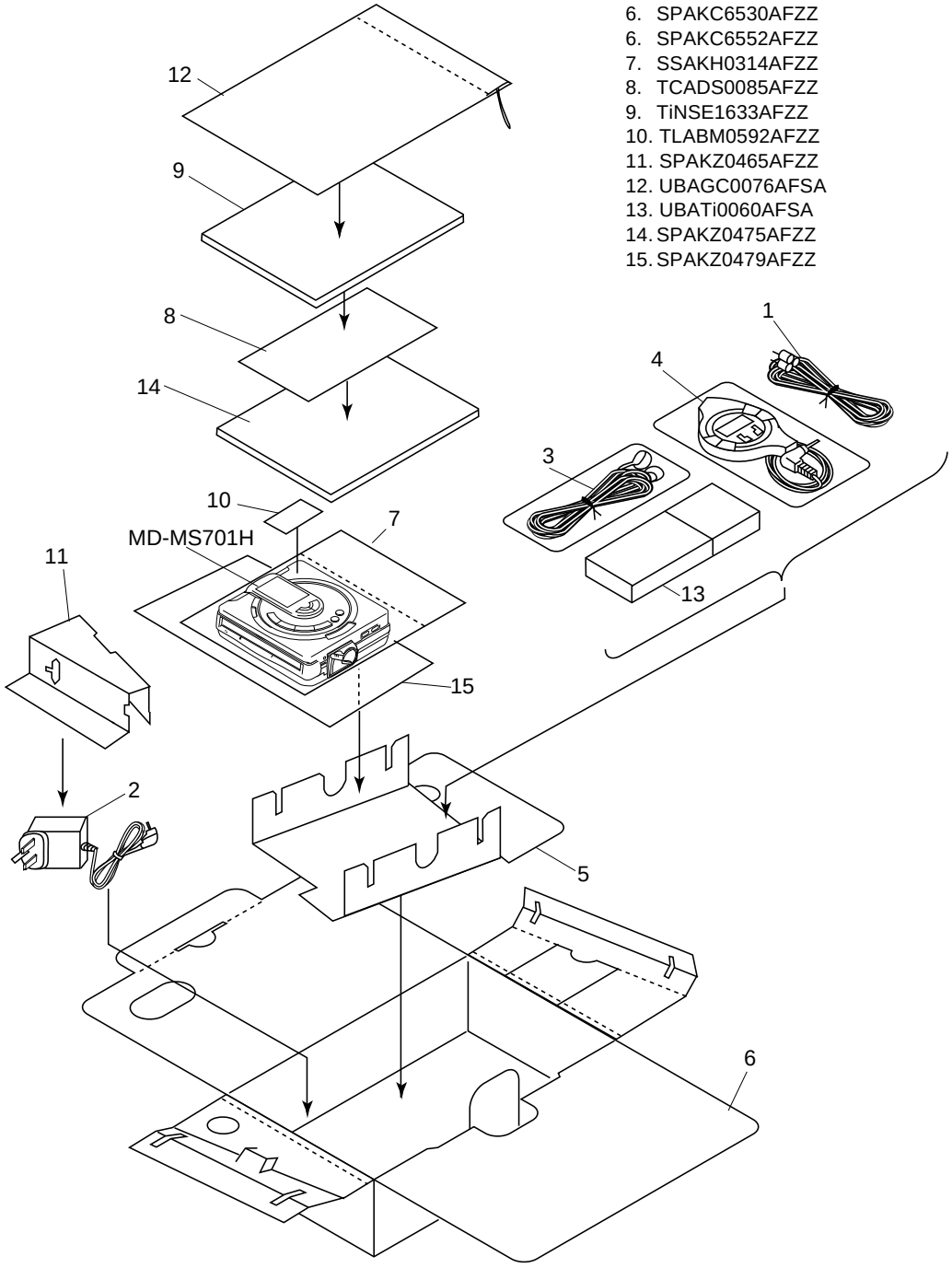


Figure 6 CABINET EXPLODED VIEW

PACKING METHOD (FOR UK ONLY)

SETTING POSITION OF SWITCHES AND KNOBS		
UNIT	HOLD	OFF
Remote Control	HOLD	CANCEL



1.	QCNMG0382AFZZ	Connecting Cord, RCA Type
2.	RADPA8404AFZZ	AC Adaptor
3.	RPHOH0176AFZZ	Headphones
4.	RRMCW0024AFZZ	Remote Control
5.	SPAKA2679AFZZ	Packing Add.
6.	SPAKC6529AFZZ	Packing Case [702H GY]
6.	SPAKC6530AFZZ	Packing Case [702H BL]
6.	SPAKC6552AFZZ	Packing Case [701H]
7.	SSAKH0314AFZZ	Polyethylene Bag, Unit
8.	TCADS0085AFZZ	Service Card
9.	TiNSE1633AFZZ	Operation Manual
10.	TLABM0592AFZZ	Label, Feature [701 Only]
11.	SPAKZ0465AFZZ	Pad, AC Adaptor
12.	UBAGC0076AFSA	Carrying Bag
13.	UBATi0060AFSA	Rechargeable, Battery
14.	SPAKZ0475AFZZ	Pad, Operation Manual
15.	SPAKZ0479AFZZ	Sheet

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